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INVENTORY

OF

SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM JANUARY 1 TO MARCH 31, 1920.

(No. 62; Nos. 49124 to 49796.)

WASHINGTON:
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CONTENTS.

	Page.
Introductory statement	1
Inventory	5
Index of common and scientific names	87

ILLUSTRATIONS.

	Page.
PLATE I. The fire-lily of Victoria Falls. (*Buphane disticha* (L. f.) Herbert, S. P. I. No. 49256)	16
II. The m'bulu, an East African shrub allied to the mock orange. (*Cardiogyne africana* Bureau, S. P. I. No. 49319)	16
III. A latex-producing shrub from Mozambique. (*Conopharyngia elegans* Stapf, S. P. I. No. 49322)	24
IV. An East African relative of the mangosteen. (*Garcinia livingstonei* T. Anders., S. P. I. No. 49462)	24
V. A drought-resistant ornamental from Northern Rhodesia. (*Ochna polyneura* Gilg., S. P. I. No. 49595)	58
VI. A new relative of the Kafir orange. (*Strychnos* sp., S. P. I. No. 49599)	58
VII. Fruits of the maululu from the Zambezi Basin. (*Canthium lanciflorum* Hiern, S. P. I. No. 49608)	58
VIII. A fruiting tree of the maululu. (*Canthium lanciflorum* Hiern, S. P. I. No. 49608)	58

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INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM JANUARY 1 TO MARCH 31, 1920 (NO. 62; NOS. 49124 TO 49796).

INTRODUCTORY STATEMENT.

During the period of three months covered by this inventory, Wilson Popenoe, Agricultural Explorer for this office, was exploring and collecting living plant material in the region of the city of Guatemala, Coban, Tucuru, Antigua, and El Barranquillo in the Republic of Guatemala, and Dr. H. L. Shantz, as Agricultural Explorer attached to the Smithsonian Expedition, was exploring and collecting in Mozambique, East Africa, Northern Rhodesia, and the Belgian Kongo. Inasmuch as both of these explorers are experienced travelers and especially familiar with American agriculture, what they collected has unusual value.

Of Mr. Popenoe's introductions described here, the following appear at this time of particular interest:

The large-fruited subtropical hawthorn (*Crataegus stipulosa*, No. 49145), which is used for jellies and preserves, reminds us of Frank N. Meyer's discovery and introduction of the large grafted Chinese haws which have grown well in this country. The pacaya palm (*Chamaedorea* sp., No. 49325) has an inflorescence which is used extensively as a salad in Guatemala. The two superior varieties of the coyó (*Persea schiedeana*, Nos. 49329 and 49330), a close relative of the avocado, represent a fruit new to horticulture and one of great value for tropical and subtropical regions; these fruits, according to Mr. Popenoe, have even a better flavor than the avocado. The three remarkable tropical blackberries (*Rubus* spp., 49331 to 49333) from Alta Vera Paz ought at least to be valuable for breeding purposes. An entirely new species of Annona (*A. scleroderma*, No. 49371), called the "posh," has a thick, hard-shelled fruit and ought to make a good shipper; its delicious snow-white flesh, which is more acid and sprightly than that of the sugar-apple, should make it popular. The ochoy (*Paspalum fasciculatum*, No. 49401) and the "hotz kor" (*Chaetochloa paniculifera*, No. 49372) are considered among the best pasture grasses of Guatemala and since they are adapted to moist regions should be available for trial on the Everglades; and the "kos-kún" (*Pennisetum complanatum*, No. 49763), a most important grass from Antigua, may also thrive there. Other interesting plants listed here with Mr. Popenoe's careful descriptions include an undetermined species of walnut from Alta Vera

1923

Paz (*Juglans* sp., No. 49375); seven pasture and forage grasses from Alta Vera Paz (Nos. 49376 to 49382); *Persea donnell-smithii* (No. 49383), a wild species related to the avocado; two new species of scarlet sage (*Salvia* spp., Nos. 49389 and 49742), one with flowers somewhat richer in color than those of the scarlet sage in cultivation in America and the other with flowers twice as large; also a new blue-flowered species (*Salvia amarissima*, 49780) and a species of Alpinia (No. 49443), related to the ginger of commerce, which produces bright-red fruits used by the Kekchi Indians as an ingredient of soups and stews. *Dahlia maxonii* (No. 49757), a new species discovered by Mr. Popenoe, grows to a height of 18 feet and bears lilac-pink flowers, whereas *D. popenovii* (No. 49758) is only 4 feet high and bears crimson flowers. Doctor Safford considers the latter to be one of the wild parents of the cultivated cactus dahlias.

Doctor Shantz's introductions which should be emphasized are as follows:

Panicum madagascariense (No. 49210), a grass for the sandy soils of the South; the m'goma tree (*Ricinodendron rautanenii*, Nos. 49213 and 49214) of Southern Rhodesia, the wood of which is remarkably light; the Morula (*Sclerocarya caffra*, Nos. 49215 and 49315), a beautiful tree bearing edible fruits with oily seeds; a tropical jujube (*Ziziphus mucronata*, No. 49219) from Bulawayo; the Rhodesian teak (*Baikiaea plurijuga*, No. 49228); the Rhodesian ash (*Burkea africana*, No. 49230); the Rhodesian mahogany (*Pahudia quanzensis*, No. 49241); two wild persimmons (*Diospyros* spp., Nos. 49235 and 49236) from Victoria Falls and two from the Transvaal (Nos. 49298 and 49299); the inkulu (*Diospyros senegalensis*, No. 49586) from the Kafue River; the uteta tree (*Caesalpinia* sp., No. 49460), a legume bearing poisonous pods which the natives boil in four successive waters before they are safe to eat; the popular native fruit mahobohobo (*Uapaca sansibarica*, No. 49466), astringent when green but sweet when ripe; the impinji (*Ximenia americana*, No. 49467), a fruit resembling the American plum; and three as yet undetermined species—the m'seche (No. 49469) having the odor of a lychee, the m'fwefee (No. 49470) with very sweet edible fruits, and the m'tantanvara (No. 49471) with fruits like the wild cherry. The Kafir orange (*Strychnos spinosa*) has fruited so well in Forida that another small-fruited species (No. 49599), with an agreeable flavor, may make the improvement of this wild fruit possible. The m'tingele (No. 49607), the maululu (*Canthium lanciflorum*, No. 49608, reported to be one of the most delicious fruits of the Victoria Falls region), and the m'pila (No. 49609) are promising wild fruits.

Fenugreek is an important forage crop in Egypt and has just fallen short of being a real success in our own South. Its relative from New South Wales (*Trigonella suavissima*, No. 49124), which Sir Thomas Mitchell recommends for use like spinach, deserves to be thoroughly tested.

Through Consul Deichman, of Valparaiso, we have received a valuable collection of Chilean trees, some of which will doubtless find a home in the region around San Francisco, where already several of these Chilean species seem quite at home. They include three of the Chilean oaks (*Nothofagus* spp., Nos. 49274 to 49276).

Vicary Gibbs has sent us bulbs of the beautiful Nomocharis (*N. pardanthina*, No. 49281), a lilylike plant from western China, which, Reginald Farrer says, the Chinese eat as they do onions.

Stranvaesia davidiana (No. 49287) is a valuable new shrub from western China which has behaved as an evergreen in Washington, D. C., and deserves to be used extensively in dooryards; it is attractive through the winter.

It remains to be seen whether Mr. Neipp's *Gladiolus malangensis* (No. 49369) from west Africa is of value for the breeders of this showy and popular flower.

J. B. Norton, the asparagus breeder, has seeded at Hartsville, S. C., what he considers the hardiest of the evergreen ornamental species of asparagus (*Asparagus acutifolius*, No. 49458) and recommends it for dooryard hedges. It is suggestive of a fine-leaved juniper, and since it has storage roots and drought-resistant foliage it should be valuable for dry regions.

Through the kindness of Doctor Burns, of the Bombay Department of Agriculture, 16 species of forage grasses (Nos. 49506 to 49521) have been obtained for trial by Professor Piper, particularly in the Southern States.

An entirely new cereal crop from Sierra Leone, called fundi (*Digitaria exilis*, Nos. 49522 to 49524), is sent in by Mr. Scotland, Director of Agriculture. It is reported to be adapted to light soils and to produce a grain of very good flavor suited for the use of invalids.

The massaranduba (*Mimusops huberi*, No. 49709), of Para, is related to the sapote and may succeed in southern Florida; it is a market fruit in Para. The cupú-assú (*Theobroma grandiflora*, No. 49710) from this same region, a close relative of cacao, bearing its fruits on the trunk, is one of the most important fruit trees of the State of Para. Neither of these appears to have been cultivated elsewhere in the Tropics.

The goa bean (*Botor tetragonoloba*, No. 49711) has grown well in Florida, and since its young pods make a delicious vegetable similar to snap beans it deserves study as a winter vegetable for shipping to northern markets. Its edible tubers are said to contain 24 per cent of protein.

Since the hondapara of India (*Dillenia indica*, No. 49713) has flowered at Miami it deserves further study as an ornamental and fruit tree as well.

An unusual collection of seeds (Nos. 49613 to 49661) has been sent in by Mr. Cave, curator of the Lloyd Botanic Garden at Darjiling. It includes *Berberis angulosa* (No. 49616) with berries nearly an inch long; a Himalayan birch (*Betula utilis*, No. 49620) from Kashmir; a Chinese hazelnut (*Corylus ferox*, No. 49626), 20 feet tall; the blady grass (*Imperata cylindrica*, No. 49637), which produces a paper pulp almost equal to that of esparto; the giant lily (*Lilium*

giganteum, No. 49641), growing to 9 feet in height; *Michelia excelsa* (No. 49642) and *M. lanuginosa* (No. 49643), two beautiful trees; *Piptanthus nepalensis* (No. 49645), a hardy evergreen climber with large racemes of yellow flowers; a wild cherry tree (*Prunus cerasoides*, No. 49647) with cymes of rose-red flowers; and a species of currant (*Ribes griffithii*, No. 49651) with fruit clusters 9 inches long.

The botanical determinations of seeds introduced have been made and the nomenclature revised by H. C. Skeels: and the descriptive and botanical notes have been arranged by G. P. Van Eseltine, who has had general supervision of this inventory. The manuscript has been prepared by Miss Esther A. Celander and Miss Patty T. Newbold.

DAVID FAIRCHILD,
Agricultural Explorer in Charge.

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION,
Washington, D. C., October 18, 1921.

INVENTORY.[1]

49124. TRIGONELLA SUAVISSIMA Lindl. Fabaceæ.

From Sydney, New South Wales. Seeds presented by J. H. Maiden, director, Botanic Gardens, through A. J. Pieters, of the Bureau of Plant Industry. Received January 9, 1920.

This cloverlike plant, called "Darling clover" in Australia, where it is native, has fragrant stems and foliage and in favorable locations is perennial, becoming 3 feet or more in height. When grown on rich black soils subject to periodic inundations it produces a large quantity of nutritious herbage, of which stock are particularly fond and on which they fatten. It provides good feed in late winter and early spring, hence it is a valuable addition to pastures. Sir Thomas Mitchell wrote of this plant, which he called "Australian shamrock," "The perfume of this herb, its freshness and flavor, induced me to try it as a vegetable, and we found it delicious and tender as spinach." The perfume is due to the presence of coumarin. If cut when in flower and properly cured it makes good hay. (Adapted from *Kew Bulletin of Miscellaneous Information, 1909, p. 12.*)

49125 to 49137.

From Rochester, N. Y. Cuttings presented by John Dunbar, assistant superintendent of parks. Received January 3, 1920.

49125. BERBERIS DUROBRIVENSIS C. Schneid. Berberidaceæ. **Barberry.**

"*Berberis durobrivensis* is a supposed hybrid between *B. poireti* and some unknown species which was raised at Rochester, therefore its specific name." (*Alfred Rehder.*)

49126. BERBERIS EMARGINATA Willd. Berberidaceæ. **Barberry.**

A Siberian Berberis which becomes 3 or 4 feet in height. The leaves are narrowly obovate, and the yellow flowers appear in May. The slender red fruits mature in September and October. (Adapted from *Guimpel, Otto, and Hayne, Abbildungen der fremden Holzarten, vol. 1, p. 78, pl. 62.*)

49127. BERBERIS OBLONGA (Regel) C. Schneid. Berberidaceæ. **Barberry.**

"Allied to *Berberis heteropoda*, but has angular branches, obovate leaves, and 10 to 20 flowered racemes, followed by oblong fruits. The plant is a native of Turkestan." (*Alfred Rehder.*)

[1] All introductions consist of seeds unless otherwise noted.

It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in these inventories are those which the material bore when received by the Office of Foreign Seed and Plant Introduction and, further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in these inventories in many cases undoubtedly will be changed by the specialists interested in the various groups of plants and the forms of the names brought into harmony with recognized American codes of nomenclature.

49125 to 49137—Continued.

49128. BERBERIS POIRETI C. Schneid. Berberidaceæ. **Barberry.**

A hardy and handsome shrub, native to northern China, with slender, arching branches and simple spines. It reaches 5 feet in height. The leaves are quite narrow, with green lower surfaces, and the ovoid or oblong fruits are a deep blood red. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 1, p. 490.*)

49129. BERBERIS VERRUCULOSA Hemsl. and Wils. Berberidaceæ. **Barberry.**

This attractive Chinese Berberis is found as an evergreen shrub in western Szechwan, where it becomes 3 or 4 feet in height. The yellow flowers and ovoid purplish blue fruits are borne among the small, very spiny leaves. (Adapted from *Curtis's Botanical Magazine, pl. 8454.*)

49130. BERBERIS VULGARIS L. Berberidaceæ. **Barberry.**

Variety *lutea.*

"Mr. Dunbar showed me *Berberis vulgaris* var. *lutea*, a garden hybrid. It is a small, pale, slender-fruited form, not a particularly free fruiter but would carry its seedlessness, I believe." (*David Fairchild, Report of Western Trip, 1919, p. 16.*)

49131. EVODIA DANIELLII (Benn.) Hems. Rutaceæ.
(*Xanthoxylum daniellii* Benn.)

A moderate-sized bushy tree, 10 to 20 feet high, with unequally pinnate leaves up to 3 inches in length. The flowers appear in June and July in numerous corymbose panicles. The fruit consists of a number of oblong or elongated capsules which have a peculiar aromatic odor and a pungent bitter flavor. The Chinese are said to use parts of this fruit as a condiment. (Adapted from *Bennett, Annals and Magazine of Natural History, 3d ser., vol. 10, p. 198.*)

49132. HAMAMELIS MOLLIS Oliver. Hamamelidaceæ.

A large bush or small tree, sometimes 30 feet high, native to western China. The roundish short-stemmed toothed leaves are 4 to 5 inches long, and the golden-yellow flowers are borne in nearly sessile heads. (Adapted from *Curtis's Botanical Magazine, pl. 7884.*)

49133 and 49134. HIBISCUS SYRIACUS L. Malvaceæ. **Rose of Sharon.**

49133. White and red. **49134.** Variety *caeruleus.*

49135. MALUS FLORIBUNDA Siebold. Malaceæ. **Apple.**
(*Pyrus floribunda* Kirchn.)

"The best known of the eastern Asiatic crabs is *Malus floribunda.* This is one of the handsomest and most satisfactory of all flowering trees for this climate. It blooms every year without fail, and as it reaches maturity it assumes a picturesque habit. The bright pink flower buds are very beautiful and the masses of small flowers which completely cover the branches are at first pink and gradually become white." (*Bulletin of Popular Information, Arnold Arboretum, No. 3.*)

49136. PARROTIA PERSICA (DC.) Meyer. Hamamelidaceæ.

A small tree, 10 to 15 feet high, found native in Persia and Transcaucasia. The alternate coarsely toothed leaves become brilliantly colored in autumn, and the heads of small flowers are conspicuous for their scarlet anthers. The wood of this tree is exceedingly hard and durable. (Adapted from *Curtis's Botanical Magazine, pl. 5744.*)

49125 to 49137—Continued.

49137. TAMARIX HISPIDA Willd. Tamaricaceæ. Tamarisk.

A very ornamental shrub of graceful habit, not more than 4½ feet high, with very finely divided leaves and beautiful racemes of minute pink flowers, which appear in September. (Adapted from *Revue Horticole, vol. 66, p. 352, pl. 1894.*)

49138 to 49144.

From Shansi, China. Presented by Prof. Joseph Bailie, Berkeley, Calif. Received January 3, 1920.

49138. AVENA NUDA Hoejer. Poaceæ. Naked oats.

"Huskless oats from Shansi Province." (*Bailie.*)

49139. CHAETOCHLOA ITALICA (L.) Scribn. Poaceæ. Millet. (*Setaria italica* Beauv.)

A variety with straw-colored seeds.

49140. HOLCUS SORGHUM L. Poaceæ. Sorghum. (*Sorghum vulgare* Pers.)

"Kaoliang seed from Shansi Province."

49141. LINUM USITATISSIMUM L. Linaceæ. Flax.

"*Hu ma tze* from Taichow." (*Bailie.*)

49142. PINUS BUNGEANA Zucc. Pinaceæ. White-barked pine.

Seeds of one of the most strikingly beautiful of the oriental conifers.

For previous introduction and description, see S. P. I. No. 42730.

49143 and 49144. SOLANUM TUBEROSUM L. Solanaceæ. Potato.

49143. Tubers from an unnamed variety.

49144. Seed from an unnamed variety.

49145 to 49148.

From the city of Guatemala, Guatemala. Seeds collected by Wilson Popenoe, Agricultural Explorer for the Bureau of Plant Industry. Received January 5, 1920. Quoted notes by Mr. Popenoe.

49145. CRATAEGUS STIPULOSA (H. B. K.) Steud. Malaceæ. Manzanilla.

"(No. 232*a*.) The manzanilla is a large shrub or small tree, native to Guatemala, attaining a height of about 20 feet. In the spring it produces white flowers resembling apple blossoms, and in the fall the yellow applelike fruits, about 1¾ inches in diameter, are gathered and eaten in various ways, principally stewed and in the form of jelly."

For previous introduction, see S. P. I. No. 45575.

49146. PASSIFLORA LIGULARIS Juss. Passifloraceæ. Sweet granadilla.

"(No. 233*a*.) The sweet granadilla is grown in the highlands of Guatemala and produces fruit the size of a hen's egg, with a thick, brittle shell inclosing a white gelatinous pulp with a delicate aromatic flavor."

For previous introduction, see S. P. I. No. 43437.

49147. RUBUS TUERCKHEIMII Rydb. Rosaceæ. Mora.

"(No. 234*a*.) A wild Rubus common in the vicinity of San Lucas, Guatemala, at an altitude of nearly 7,000 feet. In habit and fruit this plant resembles the blackberry; the berry is, however, lighter in color,

49145 to 49148—Continued.

with a rather acid flavor. The fruit is used for preserves and for stewing."

For previous introduction, see S. P. I. No. 43438.

49148. SPONDIAS PURPUREA L. Anacardiaceæ. **Red mombin.**

"(No. 235*a*.) A small stiff or sometimes spreading tropical American tree up to 25 feet in height, with compound leaves up to 6 inches long and purplish maroon flowers in few-flowered racemes. The oblong-ovoid fruit is commonly purplish and about an inch in length."

49149 to 49160.

From Victoria Falls, Rhodesia. A collection of seeds presented by C. Starke & Co., Mowbray, Cape Town, through Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received January 6, 1920. Quoted notes by Doctor Shantz.

49149. CHAETOCHLOA ITALICA (L.) Scribn. Poaceæ. **Millet.**
(*Setaria italica* Beauv.)

"(No. 284.) Boer manna."

49150 to 49152. CITRULLUS VULGARIS Schrad. Cucurbitaceæ. **Watermelon.**

"Three varieties."

49150. "(No. 288.) Starke's Mammoth White Kafir melon."

49151. "(No. 290.) 'Tsama melon.'"

49152. "(No. 291.) 'Monketaan melon.'"

49153. CUCURBITA MAXIMA Duchesne. Cucurbitaceæ. **Pumpkin.**

"(No. 289.) Fraserdale Improved Boer pumpkin."

49154. HORDEUM VULGARE PALLIDUM Seringe. Poaceæ. **Barley.**

"(No. 287.) Cape 6-rowed barley."

49155. HORDEUM VULGARE TRIFURCATUM (Schlecht.) Beaven. Poaceæ. **Barley.**

"(No. 286.) Nepal or beardless barley-wheat."

49156. MEDICAGO SATIVA L. Fabaceæ. **Alfalfa.**

"(No. 282.) Recleaned Cape lucern."

49157. MELILOTUS INDICA (L.) All. Fabaceæ. **Yellow sweet clover.**

"(No. 281.) Cape Stink Klaver."

49158. PHALARIS MINOR Retz. Poaceæ. **Grass.**

"(No. 283.) Cape Canary seed."

An annual grass, native to the Mediterranean countries, but introduced into many parts of the world. It is erect or ascending with tufted culms up to 3 feet in height and linear leaves from 2 to 6 inches long. (Adapted from *Thiselton-Dyer, Flora Capensis, vol. 7, p. 682.*)

49159. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean.**

"(No. 280.) Green Moonghi."

49160. SECALE CEREALE L. Poaceæ. **Rye.**

"(No. 285.) Cape Early rye."

49161. FAGOPYRUM VULGARE Hill. Polygonaceæ. **Buckwheat.**
(*F. esculentum* Moench.)

From Brisbane, Queensland. Presented by H. C. Quodling, director, Department of Agriculture. Received January 6, 1920.

"*Sarrasin.* Although we received the original sample under the name of 'Sarragin' buckwheat, I am of the opinion that 'Sarrasin' is the correct name." (*Quodling.*)

49162 to 49173.

From Victoria Falls, Southern Rhodesia. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received January 8, 1920. Quoted notes by Doctor Shantz.

49162. BAUHINIA sp. Cæsalpiniaceæ.

"(No. 262. Victoria Falls. November 16, 1919.) A large tree with a large, dry, almost solid pod."

49163. LUFFA CYLINDRICA (L.) Roemer. Cucurbitaceæ.
(*L. aegyptiaca* Mill.)

"(No. 273*a*. Victoria Falls. November 17, 1919.) A Luffa growing in the garden at the hotel; may be a native form; it forms a large fibrous pepo about 6 or 7 inches long."

49164. MARKHAMIA sp. Bignoniaceæ.

"(No. 265. Victoria Falls. November 17, 1919.) A small tree with long pods bearing winged seeds."

49165. OPLISMENUS AFRICANUS CAPENSIS (Hochst.) Stapf. Poaceæ. **Grass.**

"(No. 273. Victoria Falls. November 17, 1919.) A grass from a palm grove; it looks to be good forage, especially for partially shaded areas of the South."

49166. THUNBERGIA sp. Acanthaceæ.

"(No. 274. Victoria Falls. November 17, 1919.) A shrub or woody vine with fragrant white flowers and black fruits."

49167. XIMENIA AMERICANA L. Olacaceæ. **False sandalwood.**

"(No. 248. Victoria Falls. November 13, 1919.) *Impinji.* A small plum with reddish yellow or orange skin which is bitter and unpleasant, but the flavor much like a good cherry, not sour and not sweet. Grows on a small tree and fruits abundantly. Should be useful for jam and jelly; also as a flavor for drinks."

49168. HELIANTHUS ARGOPHYLLUS Torr. and Gray. Asteraceæ. **Sunflower.**

"(No. 247. Beira, Mozambique. November 3, 1919.) A silver-leaved sunflower grown as an ornamental at Beira and at Lourenco Marques."

49169. GARCINIA LIVINGSTONEI T. Anders. Clusiaceæ.

"(No. 263*a*. Victoria Falls. November 17, 1919.) *Munkononga.* An evergreen tree with heavy branches; loaded with fruit on the larger small branches. Fruit orange color, of very pleasant flavor and eagerly devoured by natives and apes."

49170. TOUNATEA MADAGASCARIENSIS (Desv.) Kuntze. Cæsalpiniaceæ.
(*Swartzia madagascariensis* Desv.)

"(No. 263. Victoria Falls. November 15, 1919.) A medium-sized tree with long, narrow, sugar-bearing pods."

49162 to 49173—Continued.

49171. (Undetermined.)

"(No. 266. Victoria Falls, November 17, 1919.) A 'wait-a-bit' woody vine with large pods 3 to 4 inches long."

49172. (Undetermined.)

"(No. 270. Victoria Falls. November 17, 1919.) A small tree with yellow flowers and beadlike fruits."

49173. URGINEA ALTISSIMA (L. f.) Baker. Liliaceæ.

"(No. 271. Victoria Falls. November 17, 1919.) A large bulb with tall spikes of greenish white flowers about 3 feet high; abundant."

49174. RUBUS sp. Rosaceæ. **Raspberry.**

From Porto Rico. Plants presented by E. E. Barker, plant breeder, Insular Experiment Station, Rio Piedras. Received January 8, 1920.

"On a recent trip into a mountainous part of the island in the district of Aibonito, I found the native raspberry, called 'fresa,' growing luxuriantly. The plants grow a meter or more in height and were in dense patches. They were in flower and beginning to fruit. The fruit is large and brilliant red in color; the flavor is not remarkable." (*Baker.*)

49175. SCHIZOSTACHYUM sp. Poaceæ. **Bamboo.**

From Benkulen, Sumatra. Seeds presented by H. Wigman, Buitenzorg, Java, through F. E. Lloyd, McGill University, Montreal, Canada. Received January 8, 1920.

Bamboos of this genus, according to Munro, "are very closely allied to Melocanna." G. F. Richmond, in the Philippine Journal of Science, Sect. A, vol. 5, p. 233, gives results of an experimental cutting of *Schizostachyum mucronatum* for pulp. Approximately one-quarter of an acre produced about 4 tons of air-dry material free of nodes. "This weight will produce approximately 2 short tons (1,812 kg.) of pulp."

49176 to 49196. CORYLUS spp. Betulaceæ. **Filbert.**

From St. Jean-le-Blanc, Orleans, France. Plants and cuttings presented by Edmond Versin. Received January 9, 1920.

49176 to 49193. CORYLUS AVELLANA L.

49176. No. 1.	*Du Béarn.*	**49185.** No. 12.	*Fertile de Coutard.*
49177. No. 2.	*Fertile.*	**49186.** No. 13.	*Cob.*
49178. No. 3.	*D'Alger.*	**49187.** No. 14.	*Daviana.*
49179. No. 4.	*De Beynes.*	**49188.** No. 15.	*D'Angleterre.*
49180. No. 6.	*De Nottingham.*	**49189.** No. 17.	*Large fruited.*
49181. No. 7.	*De Brunswick.*	**49190.** No. 18.	*Golden leaves.*
49182. No. 9.	*Cosford a coque tendre.*	**49191.** No. 19.	*Des Anglais.*
		49192. No. 20.	*Atlas.*
49183. No. 10.	*Bergeri.*	**49193.** No. 21.	*Emperor.*
49184. No. 11.	*Fructu albo.*		

49194. CORYLUS COLURNA L. **Turkish hazel.**

No. 16. The nuts of this species are small and somewhat flattened, with the roundish involucre several times longer than the nut. The tree reaches a height of 70 feet, with broad shining leaves. (Adapted from *Goeschke, Die Haselnuss, p. 41.*)

49176 to 49196—Continued.

49195 and 49196. CORYLUS MAXIMA Mill.

This is quite similar to the common filbert, *Corylus avellana*, but is more luxuriant, with the husk narrowed above the nut and forming an elongated beak. (Adapted from *Schneider, Illustriertes Handbuch der Laubholzkunde, vol. 1, p. 148.*)

49195. No. 5. *De Piémont.* **49196.** No. 8. *De Provence.*

49197 to 49221.

From Victoria Falls, Rhodesia. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received January 12, 1920. Quoted notes by Doctor Shantz.

49197. ACACIA sp. Mimosaceæ.

"(No. 224. Bulawayo, Southern Rhodesia. November 5, 1919.) A small tree which flowers and bears a heavy crop of beans."

49198. ACACIA sp. Mimosaceæ.

"(No. 227. Bulawayo, Southern Rhodesia. November 5, 1919.) A large handsome tree with very rough bark and recurved spines. It grows to a height of 30 feet and has fine foliage and probably very hard wood."

49199. ANNONA RETICULATA L. Annonaceæ. **Custard-apple.**

"(No. 214. Lourenco Marques, Mozambique. October 29, 1919.) Seed from a large custard-apple served on a boat out of Lourenco Marques."

49200. CAESALPINIA SEPIARIA Roxb. Cæsalpiniaceæ.

"(No. 220. Salisbury, Southern Rhodesia. November 4, 1919.) A 'wait-a-bit' of almost running habit of growth. Forms a hedge which is practically impenetrable because of the short recurved spines. The foliage and flowers are attractive."

49201. CAJAN INDICUM Spreng. Fabaceæ. **Pigeon-pea.**

"(No. 241. Bulawayo, Southern Rhodesia. November 6, 1919.) Dhal bean."

49202 and 49203. CITRULLUS VULGARIS Schrad. Cucurbitaceæ. **Watermelon.**

49202. "(No. 235. Bulawayo, Southern Rhodesia. November 5, 1919.) *Majoda.* A large dark Kafir melon."

49203. "(No. 234. Bulawayo, Southern Rhodesia. November 5, 1919.) *Majoda.* The ordinary melon."

49204. COMBRETUM APICULATUM Sond. Combretaceæ.

"(No. 223. Bulawayo, Southern Rhodesia. November 5, 1919.) A small tree which grows on dry land; should be tried in the South and Southwest."

49205 and 49206. CUCURBITA MAXIMA Duchesne. Cucurbitaceæ. **Pumpkin.**

49205. "(No. 237. Bulawayo, Southern Rhodesia. November 5, 1919.) *Ironbark.*"

49206. "(No. 233*a*. Bulawayo, Southern Rhodesia. November 5, 1919.) *Macleay River.*"

49207. CUCURBITA PEPO L. Cucurbitaceæ.

"(No. 233*b*. Bulawayo, Southern Rhodesia. November 5, 1919.) *Macleay River.*"

49197 to 49221—Continued.

49208. GOSSYPIUM HIRSUTUM L. Malvaceæ. **Cotton.**

"(No. 213. Beira, Mozambique. November 3, 1919.) *Nyasaland upland.* Grown at Shimba on the Zambezi. The seed is distributed to the natives and the cotton is bought from them by the Mozambique Company."

49209. HOLCUS SORGHUM SUDANENSIS (Piper) Hitchc. Poaceæ. **Sudan grass.**

"(No. 236. Bulawayo, Southern Rhodesia. November 5, 1919.)"

49210. PANICUM MADAGASCARIENSE Spreng. Poaceæ. **Grass.**

"(No. 218. Beira, Mozambique. November 3, 1919.) A fine grass; grows well on sandy land of the Beira region. It may prove valuable on sandy soils of the South. Grows to a height of about 15 inches."

49211. PASSIFLORA EDULIS Sims. Passifloraceæ. **Granadilla.**

"(No. 230. Bulawayo, Southern Rhodesia. November 5, 1919.) Seed from a granadilla served at a hotel. Fruit about 1½ by 2 inches, of an agreeable flavor."

49212. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean**

"(No. 232. Bulawayo, Southern Rhodesia. November 5, 1919.) A small green bean."

49213 and 49214. RICINODENDRON RAUTANENII Schinz. Euphorbiaceæ.

49213. "(No. 229. Bulawayo, Southern Rhodesia. November 5, 1919.) The *m'goma* tree, which produces a remarkably lightweight wood used instead of pith; it is also used as a base to be covered with metal or leather. The seeds should be sawed open for planting; otherwise germination will be very slow."

49214. "(No. 249. Victoria Falls. November 13, 1919). *M'goma.* A fine tree bearing nuts with very hard shells, but with edible kernels which are also valuable for oil. I think it will prove a valuable introduction; piles of nuts were seen near the houses of the natives of this section."

49215. SCLEROCARYA CAFFRA Sond. Anacardiaceæ. **Morula.**

"(No. 225. Bulawayo, Southern Rhodesia. November 5, 1919.) See No. 139 [S. P. I. No. 48823] and No. 193 [S. P. I. No. 49315]. The nuts are exceedingly good."

Morula nuts, the seeds of *Sclerocarya caffra*, are found in northern Transvaal. They weigh from 3 to 4 grams and measure one-half by 1 inch. They consist of 87.9 per cent of very hard shell and 12.01 per cent of kernel, which has a pleasant nutty flavor and should be very nutritious as a food. Upon ether extraction, these kernels yield from 5 to 6.3 per cent of a pale-yellow oil, which has been analyzed as follows:

Specific gravity at 15.5° C.	0.9153
Acid value (as oleic)	1.59
Saponification number	19.1
Unsaponifiable matter, per cent	.93
Wijs' iodin number	72.9
Glycerol, per cent	10.6
Hehner number	94.7

49197 to 49221—Continued.

The fatty acids probably consist of:

Stearic and palmitic acids	per cent	9.0
Oleic and linoleic acids	do	91.0

Linolic acid is absent.

(Adapted from *The Year Book of the American Pharmaceutical Association, vol. 6, p. 211.*)

49216. TETRAPLEURA sp. Mimosaceæ.

"(No. 228. Beira, Mozambique. November 3, 1919.)" A tall unarmed tree with small flowers in spiciform racemes, allied to Prosopis. (Adapted from *Oliver, Flora of Tropical Africa, vol. 2, p. 330.*)

49217. TRICHOLAENA ROSEA Nees. Poaceæ. **Natal grass.**

"(No. 219. Beira, Mozambique. November 3, 1919.) A most promising red-panicled grass [same as No. 187, S. P. I. No. 49317]. Grows everywhere from Nelspruit, Transvaal, to Salisbury, Rhodesia, and also in Mozambique. It seeds readily and seems to be early in maturing; not cultivated in Africa."

49218. STIZOLOBIUM DEERINGIANUM Bort. Fabaceæ. **Florida velvet bean.**

"(No. 231. Bulawayo, Southern Rhodesia. November 5, 1919.) Velvet beans for cattle."

49219. ZIZIPHUS MUCRONATA Willd. Rhamnaceæ.

"(No. 221. Bulawayo, Southern Rhodesia. November 5, 1919.) A small, pretty tree which fruits abundantly."

For previous introduction, see S. P. I. No. 48261.

49220. ZIZIPHUS sp. Rhamnaceæ.

"(No. 222. Bulawayo, Southern Rhodesia. November 5, 1919.) A tree much later in coming into leaf and with fruits somewhat larger than those of No. 221 [S. P. I. No. 49219]."

49221. (Undetermined.)

"(No. 226. Bulawayo, Southern Rhodesia. November 5, 1919.) A low spreading tree with black fruit."

49222. PHYLLOSTACHYS PUBERULA NIGRA (Lodd.) Houzeau. Poaceæ. (*P. nigra* Munro.) **Bamboo**

From Niles, Calif. Plants purchased from the California Nursery Co. Received January 13, 1920.

One of the most elegant of bamboos, with characteristic black stems 10 to 20 feet in height and plumelike masses of dark-green leaves. It is a native of China and Japan and is quite hardy in regions of mild winters. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 152.*)

49223. SOPHORA TETRAPTERA J. Miller. Fabaceæ. (*Edwardsia tetraptera* Poir.)

From Temuco, Chile. Seeds presented by Dr. E. W. D. Holway. Received January 13, 1920.

"These seeds were given me by a German priest, who says it is a most valuable tree on account of the extreme hardness of the wood—'hard enough for nails,' as he put it." (*Holway.*)

An exceedingly handsome large shrub or small tree, native to New Zealand. The flowers, which are borne in large clusters in spring, are deep yellow; the prominent calyx is of a bronze-gold hue. The pinnate leaves, of a somewhat silky texture, are very pleasing in appearance. (Adapted from *Gardening Illustrated, vol. 29, p. 185.*)

49224 to 49255.

From Victoria Falls, Southern Rhodesia. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received January 14, 1920. Quoted notes by Doctor Shantz.

49224. ACACIA sp. Mimosaceæ.

"(No. 276. Victoria Falls, November 17, 1919.) A fine large acacia with large pods like a Robinia; seeds usually eaten by weevils. Grows near watercourses and is one of the most attractive acacias of this section."

49225. ACACIA sp. Mimosaceæ.

"(No. 277. Victoria Falls, November 17, 1919.) A large acacia similar to No. 276 [S. P. I. No. 49224], but a 'wait-a-bit' with thin pods and smaller seeds. Very gummy when cut and bark very red."

49226. ADANSONIA DIGITATA L. Bombacaceæ.

"(No. 254. Victoria Falls, November 13, 1919.) Seed from a tree about 20 feet in diameter and about 40 feet high. Flowers about 4 inches in diameter; fruit a woolly gourd 6 inches long. The pulp of the fruit is used to make a drink."

49227. ARACHIS HYPOGAEA L. Fabaceæ. **Peanut.**

"(No. 240. Bulawayo, Southern Rhodesia, November 6, 1919.) A cluster peanut from British East Africa."

49228. BAIKIAEA PLURIJUGA Harms. Cæsalpiniaceæ. **Rhodesian teak.**

"(No. 255. Victoria Falls, November 13, 1919.) A fine large tree; the best timber tree of the country, but the wood is hard to work."

49229. BRACHYSTEGIA RANDII Baker f. Cæsalpiniaceæ.

"(No. 252. Victoria Falls, November 13, 1919.) A beautiful tree 20 to 30 feet high. The wood is comparatively soft and not termite proof. The bark yields an excellent fiber and is used by the natives in building their huts."

49230. BURKEA AFRICANA Hook. Cæsalpiniaceæ. **Rhodesian ash.**

"(No. 253. Victoria Falls, November 13, 1919.) One of the most common plants of the dry African forests; known as 'Rhodesian ash'; does best in sandy soil. Has tough, coarse-grained wood; the seeds are said to be used as food in times of famine."

49231. CANAVALI ENSIFORME (L.) DC. Fabaceæ. **Jack bean.**

"(No. 246. Bulawayo, Southern Rhodesia, November 6, 1919.) A native bean with a pod 12 to 18 inches long. Not edible."

49232. CITRULLUS VULGARIS Schrad. Cucurbitaceæ. **Watermelon.**

"(No. 242. Bulawayo, Southern Rhodesia, November 6, 1919.) '*Man Rataan*,' a Kafir melon."

49233. COPAIVA COLEOSPERMA (Benth.) Kuntze. Cæsalpiniaceæ.
(*Copaifera coleosperma* Benth.)

"(No. 260. Victoria Falls, November 15, 1919.) A fine tree, which produces heavy crops of 1-seeded pods. The papery outer cover of the bean is very red."

49224 to 49255—Continued.

49234. CUCURBITA PEPO L. Cucurbitaceæ. **Pumpkin.**

"(No. 245. Bulawayo, Southern Rhodesia. November 6, 1919.) Natal. Mixed cattle pumpkins."

49235. DIOSPYROS sp. Diospyraceæ. **Persimmon.**

"(No. 272. Victoria Falls. November 17, 1919.) A tree covered with fruit from 1 to 1½ inches in diameter; brown hairs on the surface."

49236. DIOSPYROS sp. Diospyraceæ. **Persimmon.**

"(No. 278. Victoria Falls. November 17, 1919.) A small tree the fruit of which is eaten by birds. The fruit appears to be black."

49237. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

"(No. 243. Bulawayo, Southern Rhodesia. November 6, 1919.) Kafir corn."

49238. IPOMOEA sp. Convolvulaceæ. **Morning-glory.**

"(No. 250. Victoria Falls. November 13, 1919.) A more or less woody perennial vine with clustered light or purplish flowers; would be suitable as a porch or arbor vine."

49239. MIMUSOPS ZEYHERI Sond. Sapotaceæ.

"(No. 264. Victoria Falls. November 17, 1919.) A fruit tree. The fruits are eaten by the natives and also by apes."

49240. OCHNA PULCHRA Hook. Ochnaceæ.

"(No. 257. Victoria Falls. November 15, 1919.) A beautiful tree 10 to 30 feet high, which produces a quantity of beautiful racemes of yellow flowers and fruit."

49241. PAHUDIA QUANZENSIS (Welw.) Prain. Cæsalpiniaceæ.
(*Afzelia quanzensis* Welw.) **Mahogany bean.**

"(No. 258. Victoria Falls. November 16, 1919.) A fine large tree; beautiful for shade and the beans highly prized as ornaments. The wood is very beautiful; usually called 'Rhodesian mahogany' or 'pod mahogany.' The tree becomes from 2 to 7 feet in diameter, the latter size exceptional."

49242. PENNISETUM GLAUCUM (L.) R. Br. Poaceæ. **Pearl millet.**
(*P. typhoideum* Pers.)

"(No. 238. Bulawayo, Southern Rhodesia. November 6, 1919.) *Nyanti.*"

49243. PSEUDOLACHNOSTYLIS sp. Euphorbiaceæ.

"(No. 256. Victoria Falls. November 15, 1919.) A peculiar shrub or small tree. It has fruits with a sweetish sticky outer cover and a peculiar method of dehiscence."

49244. PTEROCARPUS sp. Fabaceæ.

"(No. 269. Victoria Falls. November 17, 1919.) A small tree."

49245. TERMINALIA sp. Combretaceæ.

"(No. 267. Victoria Falls. November 17, 1919.) *Mongolas.* A large tree with tough wood and bark."

49246. TETRAPLEURA sp. Mimosaceæ.

"(No. 275. Victoria Falls. November 17, 1919.) A beautiful tree producing large pods. The tree is useful in many ways."

49224 to 49255—Continued.

49247. TETRAPLEURA sp. Mimosaceæ.

(Victoria Falls. November 17, 1919. Pod containing seed; no label.)

49248. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

"(No. 239. Bulawayo, Southern Rhodesia. November 6, 1919.) Indumba Kafir bean."

49249. VOANDZEIA SUBTERRANEA (L.) Thouars. Fabaceæ.

"(No. 244. Bulawayo, Southern Rhodesia. November 6, 1919.) *Inshluba.* Kafir beans."

49250. XIMENIA AMERICANA L. Olacaceæ. **False sandalwood.**

"(No. 279. Victoria Falls. November 14, 1919.) *Impinji.* A plum-like fruit similar to No. 248 [S. P. I. No. 49167], but larger and later; strong wild-cherry odor."

49251. (Undetermined.)

"(No. 259. Victoria Falls. November 15, 1919.) A small tree with a strong odor of pepper when the leaves, stem, or fruits are crushed."

49252. TOUNATEA MADAGASCARIENSIS (Desv.) Kuntze. Cæsalpiniaceæ. (*Swartzia madagascariensis* Desv.)

"(No. P. 263. Victoria Falls. November 15, 1919.) A medium-sized tree with long, narrow sugar-bearing pods."

49253. HIPPOCRATEA OBTUSIFOLIA Roxb. Hippocrateaceæ.

"(No. 261. Victoria Falls. November 15, 1919.) A peculiar woody vine with clusters of fruits attached by the end of the wing, with the heavy or seed end hanging free."

49254. LEIOPTYX CONGOENSIS Pierre. Meliaceæ.

"(No. 268. Victoria Falls. November 17, 1919.) A large tree with large pods bearing large winged seeds."

49255. (Undetermined).

"(No. 251. Victoria Falls. November 13, 1919.) A large acacialike tree with large flat pods."

49256. BUPHANE DISTICHA (L. f.) Herbert. Amaryllidaceæ. **Fire-lily.**

From Victoria Falls, Rhodesia. Bulbs collected by Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received January 14, 1920.

"(No. 292. Victoria Falls. November 17, 1919.) The fire-lily or poison-lily; a flame of fire without leaves. Very characteristic." (*Shantz.*)

For an illustration of this plant as it grows in Northern Rhodesia, see Plate I.

49257. EXOGONIUM PURGA (Wender.) Benth. Convolvulaceæ. (*Ipomœa purga* Hayne.)

From Bahia, Brazil. Roots presented by H. M. Curran. Received January 14, 1920.

"I am sending a sample of *batata de purga.* It is a strong-growing Ipomœa-like vine, with ornamental white flowers about 3 inches across the corolla. The vine is smooth, quadrangular, with ribbonlike wings at the angles, as in *Passiflora quadrangularis.* The ends of the twigs and the calyx are pale yellowish green. This plant is common in the second-growth forests and abandoned



THE FIRE-LILY OF VICTORIA FALLS. (BUPHANE DISTICHA (L. F.) HERBERT, S. P. I. No. 49256.)

This plant is one of the most brilliant in the amaryllis family, a group of noteworthy ornamentals. The effect of the huge clusters is like that of so many splotches of flame. In moister air, where the mist from the Falls keeps the plants continually wet, the leaves and flowers appear at the same time; but away from the Falls, where the moisture is considerably reduced, the flowers precede the foliage. (Photographed by Dr. H. L. Shantz, Victoria Falls, Southern Rhodesia, November 8, 1919; P36710FS.)



THE M'BULU, AN EAST AFRICAN SHRUB ALLIED TO THE MOCK ORANGE. (CARDIOGYNE AFRICANA BUREAU, S. P. I. No. 49319.)

This shrub is peculiar to Mozambique. It is usually found as a climber, but often forms a large bush. The fruits, about an inch across and of reddish yellow color, are said to be edible when fully ripe. The bush is very ornamental when in fruit. (Photographed by Dr. H. L. Shantz, Delgoa Bay, Mozambique, October 25, 1919; P36544FS.)

pasture lands from the coast to 50 or 100 miles inland and is found in all the small shops of the coast towns as a common remedy." (*Curran.*)

49258 to 49260.

From Medellin, Antioquia, Colombia. Seeds presented by W. O. Wolcott. Received January 15, 1920.

49258. ANNONA MURICATA L. Annonaceæ. Soursop.

"The soursop, known in Spanish-speaking countries as guanábana, is unexcelled for sherbets and refreshing drinks. The fruit is oblong, sometimes 4 or 5 pounds in weight, dark green, and prickly on the surface. The white, cottony flesh has a rich aromatic flavor. The tree is rarely more than 20 feet high and has thick glossy leaves and large greenish flowers; it is tropical in its requirements and will grow only in southern Florida." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 47874.

49259. CANAVALI ENSIFORME (L.) DC. Fabaceæ. Jack bean.

"These are called *frisol del diable,* or 'devil beans.'" (*Wolcott.*)

"The jack bean is a native of the West Indies and the adjacent mainland and is a bushy semierect annual with coarse stems, thickish leaves, purplish flowers, and hard white pods 9 to 14 inches long, each containing 10 to 14 white seeds. Usually the roots are well tubercled, and the plant will withstand much drought. It is remarkably free from insects and fungous diseases and is but slightly affected by root-knot. It is valuable as forage and as a cover crop or for green manure." (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 46977.

49260. CARICA PAPAYA L. Papayaceæ. Papaya.

"Seeds of a big variety of papaya." (*Wolcott.*)

For previous introduction, see S. P. I. No. 47586.

49261 to 49264. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Fajardo, Porto Rico. Seeds purchased from R. A. Veve, of the Fajardo Sugar Co. Received January 9, 1920.

"These varieties are known to produce fertile seeds and juices of high density." (*Veve.*)

49261. *Cristalina.*
49262. *D109.*
49263. *D117.*
49264. *D433.*

49265. MANIHOT ESCULENTA Crantz. Euphorbiaceæ. **Cassava.**
(*M. utilissima* Pohl.)

From Kingston, Jamaica. Cuttings presented by William Harris, Government botanist and superintendent of public gardens. Received August 11, 1919. Numbered January, 1920.

Introduced for testing in the southern United States, Hawaii, and Porto Rico.

Rodney.

49266. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Fajardo, Porto Rico. Seeds purchased from R. A. Veve, of the Fajardo Sugar Co. Received January 9, 1920.

"One of the varieties known to produce fertile seeds and juices of high density." (*Veve.*)

Rayada (ribbon).

49267. MANIHOT ESCULENTA Crantz. Euphorbiaceæ. **Cassava.**
(*M. utilissima* Pohl.)

From Kingston, Jamaica. Cuttings presented by William Harris, Government botanist and superintendent of public gardens. Received August 11, 1919. Numbered January, 1920.

Introduced for testing in the southern United States, Hawaii, and Porto Rico.

White red-trash.

49268 to 49278.

From Valparaiso, Chile. Seeds presented by C. F. Deichman, American consul in charge. Received January 19, 1920. The descriptive notes are adapted from Castillo and Dey, Jeografía Vejetal del Rio Valdivia, unless otherwise stated.

49268. AEXTOXICON PUNCTATUM Ruiz and Pav. Euphorbiaceæ.

Tigue. A Chilean tree belonging to the euphorbia family, with small colorless scales covering all of its parts and with dense foliage. The leaves, quite stiff and narrowly oblong in shape, are very dark green on the upper surfaces and light green or even whitish on the lower surfaces. The small white flowers are borne in short axillary racemes, and the fruits are small, black olive-shaped drupes. By reason of its beauty the wood is admirably suited for the making of small furniture, etc.

For previous introduction, see S. P. I. No. 44407.

49269. CRINODENDRON HOOKERIANUM Gay. Elæocarpaceæ.

Coicopio. A small tree, up to 30 feet in height, widely distributed in the valleys of central and southern Chile. The narrow serrulate leaves are from 3 to 5 inches long, and the blood-red fleshy flowers appear solitary in the axils. The wood, which is very white, is said to be very good for building purposes. (Adapted from *Curtis's Botanical Magazine, pl. 7160.*)

49270. EUCRYPHIA CORDIFOLIA Cav. Eucryphiaceæ.

Mucrmo. An ornamental and also useful Chilean tree which attains a height of about 15 feet, with thick, leathery, shining leaves and aromatic white flowers which appear in the spring and make the tree a beautiful sight. Because of the abundance of nectar, this tree is a favorite with the bees. The bark, rich in tannin, is utilized in dyeing and also in medicine.

For previous introduction, see S. P. I. No. 34391.

49271. EUCRYPHIA PINNATIFOLIA Gay. Eucryphiaceæ.

Guindo santo. An evergreen shrub or bush, from 3 to 10 feet high, which is particularly attractive because of its large white flowers, 2½ to 3 inches across, not unlike a large single rose with a tuft of stamens in the center. It does best in a rather moist situation protected from the strongest rays of the sun. (Adapted from *The Garden, vol. 77, p. 421.*)

49272. LAURELIA SEMPERVIRENS (Ruiz and Pav.) Tulasne. Monimiaceæ.
(*L. aromatica* Juss.)

Laurel. A tall evergreen tree with oblong, leathery leaves having an agreeable aromatic odor. It is a native of Chile, where the bark, leaves, and flowers are used medicinally as a remedy for headaches, bronchitis, digestive disorders, etc. The wood is valuable not so much because of

49268 to 49278—Continued.

its quality as of its abundance and ease of working; it varies in color from white to gray.

For previous introduction, see S. P. I. No. 35967.

49273. MAYTENUS BOARIA Molina. Celastraceæ.

Maiten. A tree with slender pendulous branches, oblong leaves, greenish yellow flowers, and seeds which furnish an oil valuable for certain medicinal purposes. The tree, which is a native of Chile, reaches a height of about 40 feet. Its ornamental value lies chiefly in the nature of the foliage, which responds to the faintest breeze with a restless quivering. The leaves are also valued for forage.

For previous introduction, see S. P. I. No. 43272.

49274. NOTHOFAGUS DOMBEYI (Mirb.) Oerst. Fagaceæ.
(*Fagus obliqua* Mirb.)

Coigüe. A majestic tree with leathery oval or elliptic short-stemmed leaves which are of an intense shining green color. It is a native of Chile, where it will grow in soil too damp for cultivation. The wood is quite valuable for building purposes.

For previous introduction, see S. P. I. No. 34381.

49275. NOTHOFAGUS OBLIQUA (Mirb.) Blume. Fagaceæ.
(*Fagus obliqua* Mirb.)

Roble. A tall deciduous tree with oval-oblong clear green leaves and 3-sided nuts. The wood, which is considered a valuable timber, varies in quality with the nature of the soil. The streets of the city of Valdivia are paved with blocks of wood of this tree. It is said to be the most northerly of the Chilean beeches.

For previous introduction, see S. P. I. No. 34384.

49276. NOTHOFAGUS PROCERA Oerst. Fagaceæ.
(*Fagus procera* Poepp. and Endl.)

Rauli. A deciduous Chilean timber tree, once abundant in the Province of Valdivia but now comparatively scarce, owing to the great demand for its wood. The wood is reddish and compact, and is used for parquet flooring, cabinetwork, etc.

For previous introduction, see S. P. I. No. 34386.

49277. PERSEA LINGUE (Ruiz and Pav.) Nees. Lauraceæ.

Lingue. An evergreen tree widely distributed in many parts of Chile. The oval-elliptic leaves are entire. The short-pedicelled flowers are of a dirty yellow color and the small roundish fruits dark violet. The aromatic properties of the leaves and the tannin of the bark make the trees of medicinal value, while the reddish yellow wood is prized both for its beauty and for its durability.

For previous introduction, see S. P. I. No. 42875.

49278. TRICONDYLUS OBLIQUA (Ruiz and Pav.) Kuntze. Proteaceæ.
(*Lomatia obliqua* R. Br.)

Radal. An evergreen tree, up to 35 feet in height, with somewhat grooved branches, alternate leathery leaves with shining upper surfaces, and axillary racemes of white flowers. The leaves are fragrant, reminding one of the European walnut, and an infusion of the bark has purgative properties utilized in medicine.

49279. CROTALARIA LABURNIFOLIA L. Fabaceæ.

From Cairo, Egypt. Seeds presented by the director of the horticultural section, Gizeh Branch, Ministry of Agriculture. Received January 20, 1920.

A low shrubby plant with slender elongated branches, compound leaves, and terminal and lateral racemes of bright-yellow flowers. It is a native of western India, where it is often seen in gardens because of its flowering throughout the year. It is also used for paper making. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 2, p. 615,* and *Hooker, Flora of British India, vol. 2, p. 84.*)

49280. CAMOENSIA MAXIMA Welw. Fabaceæ.

From Cienfuegos, Cuba. Seeds presented by Robert M. Grey, Harvard Experiment Station. Received January 24, 1920.

Probably the largest flowered and certainly one of the most delicately beautiful vines in the world. The flowers are sometimes 8 inches long and have a delicious fragrance when first opening; their pure-white fluted petals are margined with gold, changing to a darker tinge with age. This magnificent vine adorns the tops of lofty trees on the edges of forests in tropical Africa. The clusters are pendulous and sometimes contain a dozen flowers. (Adapted from the *Garden Magazine, vol. 7, p. 229.*)

This vine flowered in 1908 in the greenhouses of the United States Department of Agriculture.

For previous introduction, see S. P. I. No. 45608.

49281. NOMOCHARIS PARDANTHINA Franch. Liliaceæ.

From Elstree, Herts, England. Seeds presented by Vicary Gibbs, Aldenham House Gardens. Received January 24, 1920.

A rare liliaceous plant from western China, concerning which Reginald Farrer speaks as follows: "It is most like some hybrid of a minor lily with *Odontoglossum rosii*, combining the perverse and sinister spottings of the one with the frank and graceful loveliness of the other, with a delicacy of shell-pink coloring. You see it on the high alpine grassy slopes of Hpimaw Pass, nodding down at you with myriads of wide-open dark-eyed faces in every shade of pale rose. For 4,000 years the Chinese have devoured its bulbs like onions." (Adapted from *Gardeners' Chronicle, 3d ser., vol. 66, p. 221.*)

49282 to 49284. QUERCUS LYRATA × VIRGINIANA. Fagaceæ. **Oak.**

From College Station, Tex. Plants presented by H. Ness, horticulturist, Texas Agricultural Experiment Station. Received January 26, 1920. Quoted notes by Mr. Ness.

"The six plants are the second generation (F_2) of *Quercus lyrata* ♂ × *virginiana*, descendants of three different mother plants of the first generation. Since the first generation produced at the time no male flowers, the second generation are deferred hybrids. There are three possible male parents of this second generation; namely, the post oak (*Q. minor*), the water oak (*Q. nigra*), and the live oak (*Q. virginiana*)."

49282. "No. 1."

49283. "No. 2."

49284. "No. 3."

49285. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

From Mayaguez, Porto Rico. Seeds presented by D. W. May, Porto Rico Agricultural Experiment Station. Received January 28, 1920.

"Seed of the native tomato. There is apparently only one variety, a small wrinkled kind, somewhat bitter, immune to blight, and used mainly to flavor soups." (*May.*)

49286. ORYZA SATIVA L. Poaceæ. **Rice.**

From Manozuazabo, Santo Domingo. Seeds presented by Juan Gonzalez, through T. S. Muriel, instructor of agriculture. Received January 28, 1920.

"Called 'Cana negra.'" (*Muriel.*)

49287. STRANVAESIA DAVIDIANA Decaisne. Malaceæ.

From Kew, England. Seeds presented by W. Watson, curator, Royal Botanic Gardens. Received January 28, 1920.

Variety *salicifolia*. Probably a willow-leaved form.

"A shrub 4 to 20 feet in height with oblong or oblong-lanceolate sharp-pointed green leaves, loose clusters of white flowers, and roundish scarlet fruits. It is a native of western and central China." (*Alfred Rehder.*)

49288 to 49324.

From Lourenco Marques, Mozambique. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received January 28, 1920. Quoted notes by Doctor Shantz.

49288. ALBIZZIA ADIANTHIFOLIA (Schum.) W. F. Wight. Mimosaceæ. (*A. fastigiata* E. Mey.)

"(No. 190. Lourenco Marques, Mozambique. October 27, 1919.) A large spreading leguminous tree; favored as a shade tree."

49289. ANNONA RETICULATA L. Annonaceæ. **Custard-apple.**

"(No. 196. Lourenco Marques, Mozambique. October 27, 1919.) Seed of an Annona saved from a local tree by Mrs. John J. Ray, wife of the American consul. About 4 inches across; excellent variety."

49290. ANNONA SQUAMOSA L. Annonaceæ. **Sugar-apple.**

"(No. 197. Lourenco Marques, Mozambique. October 27, 1919.) Seed of a locally grown variety obtained from the market."

49291. ARISTOLOCHIA sp. Aristolochiaceæ.

"(No. 211. Lourenco Marques, Mozambique. October 27, 1919.) Seed of a vine used to cover fences and hedges."

49292. BIDENS PILOSA L. Asteraceæ.

"(No. 188. Nelspruit, Transvaal. October 20, 1919.) The blackjack; a good forage plant, eaten as readily as alfalfa."

49293. CAJAN INDICUM Spreng. Fabaceæ. **Pigeon-pea.**

"(No. 192. Lourenco Marques, Mozambique. October 27, 1919.) Local beans purchased in the market."

49294. CASSIA sp. Cæsalpiniaceæ.

"(No. 183a. Nelspruit, Transvaal. October 20, 1919.) An acacialike plant with sticky, long, dark pods; not eaten by stock."

49288 to 49324—Continued.

49295. CROTALARIA sp. Fabaceæ.

"(No. 184. Nelspruit, Transvaal. October 20, 1919.) Apparently a perennial legume; 8 inches high."

49296. CROTALARIA sp. Fabaceæ.

"(No. 203. Lourenco Marques, Mozambique. October 27, 1919.) A low spreading leguminous shrub with yellow flowers."

49297. DELONIX REGIA (Boj.) Raf. Cæsalpiniaceæ.
(*Poinciana regia* Hook.)

"(No. 195. Lourenco Marques, Mozambique. October 27, 1919.) The most abundant street tree; leaves large and bipinnate; pods 1½ inches broad and 12 to 18 inches long, remaining on the tree a long time."

49298. DIOSPYROS sp. Diospyraceæ. **Persimmon.**

"(No. 175. Kenkelbosch, Transvaal. September 10, 1919.) 'Jackal's fruit.' A sweetish fruit produced in abundance on a low shrub. Not eaten to any extent by the people; occasionally used as jam."

49299. DIOSPYROS sp. Diospyraceæ. **Persimmon.**

"(No. 176. Nelspruit, Transvaal. October 20, 1919.) Similar to No. 175 [S. P. I. No. 49298]."

49300. ERAGROSTIS sp. Poaceæ. **Grass.**

"(No. 179. Mafeking, Cape Province. October 2, 1919.) Looks like an important forage plant."

49301. ERAGROSTIS sp. Poaceæ. **Grass.**

"(No. 180. Mafeking, Cape Province. October 2, 1919.) Grass with the habit of *Sporobolus airoides*."

49302. ERYTHROXYLON sp. Erythroxylaceæ.

"(No. 200. Lourenco Marques, Mozambique. October 27, 1919.) A small cherrylike fruit; apparently good when fully ripe."

49303. HARPAGOPHYTUM PROCUMBENS (Burchell) DC. Pedaliaceæ.

"(No. 178. Taungs, Cape Province. September 28, 1919.) A plant with its seed large and armed with many recurved hooks."

49304. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

"(No. 189. Nelspruit, Transvaal. October 20, 1919.) Plants with the bunch habit, growing here naturally and called 'buffalo grass.'"

49305. IPOMOEA sp. Convolvulaceæ. **Morning-glory.**

"(No. 208. Lourenco Marques, Mozambique. October 27, 1919.) A low spreading Ipomoea with reddish lavender flowers."

49306. JACARANDA sp. Bignoniaceæ.

"(No. 145. Near Pretoria, Transvaal, October 12, 1919, and Lourenco Marques, Mozambique, October 27, 1919.) The most common street tree, a beautiful blue-flowered ornamental which blooms profusely."

49307. MACADAMIA TERNIFOLIA F. Muell. Proteaceæ. **Macadamia.**

"(No. 185. Nelspruit, Transvaal. October 20, 1919.) A fine large tree grown by H. S. Hall, who secured seed from Ceylon."

49308. MIMUSOPS MARGINATA N. E. Brown. Sapotaceæ.

"(No. 198. Lourenco Marques, Mozambique. October 27, 1919.) A tree, 10 to 20 feet high, bearing a small plumlike fruit, dry and puckery

49288 to 49324—Continued.

when green, but sweet when fully ripe. Eaten by the natives; also made into an intoxicating drink."

49309. MOMORDICA sp. Cucurbitaceæ.

"(No. 212. Lourenco Marques, Mozambique. October 27, 1919.) A small cucurbitaceous vine with yellow and green mottled fruits changing to bright red and with very red flesh."

49310. PAHUDIA QUANZENSIS (Welw.) Prain. Cæsalpiniaceæ. (*Afzelia quanzensis* Welw.) **Mahogany bean.**

"(No. 207. Lourenco Marques, Mozambique. October 27, 1919.) A broad spreading tree with very rich pinnate foliage, regarded as one of the most beautiful trees for street planting and for parks. It produces a beautiful mahoganylike wood, but much coarser grained."

49311. PERESKIA ACULEATA Mill. Cactaceæ.

"(No. 210. Lourenco Marques, Mozambique. October 27, 1919.) A leafy Opuntialike vine with yellow fruits half an inch in diameter. Used as an ornamental."

49312. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

"(No. 182. Johannesburg, Transvaal. October 4, 1919.) Presented by S. P. Powell; said to be a very fine variety."

49313. RICINUS COMMUNIS L. Euphorbiaceæ. **Castor-bean.**

"(No. 201. Lourenco Marques, Mozambique. October 27, 1919.) Castor-oil bean plants are abundant here."

49314. SCHEFFLERODENDRON GAZENSE E. G. Baker. Fabaceæ.

"(No. 194. Lourenco Marques, Mozambique. October 27, 1919.) A large bean from a very attractive tree found in the coastal forest."

49315. SCLEROCARYA CAFFRA Sond. Anacardiaceæ. **Morula.**

"(No. 193. Lourenco Marques, Mozambique. October 27, 1919.) A large, beautiful tree which bears edible fruit in abundance. The edible seed is a valuable oil producer. It is causing almost as much interest here as the *mufurra*. The seeds are very hard to crack."

49316. TECOMA STANS (L.) Juss. Bignoniaceæ. **Yellow tecoma.**

"(No. 209. Lourenco Marques, Mozambique. October 27, 1919.) A shrub 4 to 6 feet high, bearing yellow trumpet-shaped flowers; one of the most widely used ornamentals here."

49317. TRICHOLAENA ROSEA Nees. Poaceæ. **Natal grass.**

"(No. 187. Nelspruit, Transvaal. October 20, 1919.) A grass which seems to grow as a weed in the bush veld and in Mozambique; it makes very rapid growth as a ruderal, giving way to Cynodon."

49318. VICIA sp. Fabaceæ.

"(No. 181. Kimberley, Cape Province. September 12, 1919.) Seed of a small Vicialike plant."

49319. CARDIOGYNE AFRICANA Bureau. Moraceæ. **M'bulu.**

"(No. 204. Lourenco Marques, Mozambique. October 27, 1919.) *M'bulu.* A shrub or small tree like a mock orange."

For an illustration of this shrub, see Plate II.

49320. OCHNA ATROPURPUREA DC. Ochnaceæ.

"(No. 205. Lourenco Marques, Mozambique. October 27, 1919.) An attractive tree with pink flowers and fruit as showy as the flowers; black seeds on a pink receptacle."

49288 to 49324—Continued.

49321. OCHNA MOSSAMBICENSIS Klotzsch. Ochnaceæ.

"(No. 206. Lourenco Marques, Mozambique. October 27, 1919.) Similar to No. 205 [S. P. I. No. 49320], but a low bush, seldom over 1 to 3 feet high; seed smaller, but fruit redder and even more showy."

49322. CONOPHARYNGIA ELEGANS Stapf. Apocynaceæ.

"(No. 191. Lourenco Marques, Mozambique. October 27, 1919.) A very abundant small tree or shrub covered with large, angular pods. When in full foliage it is a very attractive ornamental and may be of value as a rubber plant. Latex abundant."

For an illustration of this plant, see Plate III.

49323. (Undetermined).

"(No. 199. Lourenco Marques, Mozambique. October 27, 1919.) Similar to No. 198 [S. P. I. No. 49308], but fruit very tart and pleasant; cherrylike."

49324. (Undetermined.)

"(No. 177. South of De Aar, Cape Province. September 13, 1919.) A few lily seeds."

49325 to 49334.

From Coban, Guatemala. Plant material collected by Wilson Popenoe, Agricultural Explorer for the Bureau of Plant Industry. Received January 29, 1920. Quoted notes by Mr. Popenoe.

49325. CHAMAEDOREA sp. Phœnicaceæ. **Pacaya palm.**

"(No. 236. Coban, Alta Vera Paz. December 27, 1919.) Plants of the *pacaya*, or Guatemalan salad palm, a species which was introduced into the United States in 1917 [see S. P. I. No. 45022], but which is worthy of a wider trial than has yet been given it. It is a tender plant, probably suitable for cultivation only in southern Florida. It likes a half-shade, plenty of moisture, and a soil rich in humus. It is a handsome small palm reaching about 20 feet in height, with a straight trunk about 2 inches in diameter and a crown of graceful pinnate leaves about 6 feet long. In Guatemala the leaves are often cut and used for house decoration. The young inflorescences, which are taken before the spathes are open, furnish a popular dish, pacaya salad. They can also be fried in batter, or boiled with other vegetables. They have a slightly bitter taste. If these inflorescences could be produced commercially in southern Florida, pacaya salad would undoubtedly find a place upon the menus of large hotels and restaurants in northern cities."

49326 to 49328. DAHLIA MAXONII Safford. Asteraceæ. **Dahlia.**

49326. "(No. 237. Coban, Alta Vera Paz. December 27, 1919.) *Single white* variety. Cuttings of a rare form of the common tree dahlia of Guatemala, producing single white starlike flowers up to 5 inches in diameter. It appears to occur only as a cultivated or semicultivated form; I have never seen it among the wild plants on the mountainsides. In habit of growth and other characteristics except the color of the flower it is identical with the typical *Dahlia maxonii*."

49327. "(No. 238. Coban, Alta Vera Paz. December 27, 1919.) *Double white* variety. Cuttings from a plant in a dooryard at Tac-



A LATEX-PRODUCING SHRUB FROM MOZAMBIQUE. (CONOPHARYNGIA ELEGANS STAPF, S. P. I. No. 49322.)

This small tree or large shrub is a very handsome ornamental when in full foliage, and as such merits attention in the South. Moreover, it produces very abundantly a milky juice, or latex, which has been suggested as of value for rubber. This shrub is closely allied to the genus Landolphia, which includes the most important rubber plants of Africa. (Photographed by Dr. H. L. Shantz, Lourenco Marques, Mozambique, October 25, 1919; P36561FS.)



AN EAST AFRICAN RELATIVE OF THE MANGOSTEEN. (GARCINIA LIVINGSTONEI T. ANDERS., S. P. I. No. 49462.)

The munkononga, or mutungun as the natives call this fruit, is one of the best indigenous fruits of East Africa. The tree is very productive and is itself very ornamental, as are the bright-orange fruits. The flesh of the fruits is juicy, orange colored, and of a delicious sprightly acid flavor. This species has already fruited in Florida, where it seems quite at home. (Photographed, slightly reduced, by Dr. H. L. Shantz, Victoria Falls, Southern Rhodesia, November 9, 1919; P36752FS.

49325 to 49334—Continued.

tic, Alta Vera Paz. This variety of the common Guatemalan tree dahlia is in cultivation at Antigua as well as in Alta Vera Paz, but it appears never to occur wild. Like the double lilac variety it has coarser leaves than the typical *Dahlia maxonii*, and its flowers are very double, pure white, and 3 to 4 inches in diameter."

49328. "(No. 239. Coban, Alta Vera Paz. December 27, 1919.) *Double lilac* variety. Cuttings from a plant growing in a dooryard at Tactic, Alta Vera Paz. This variety resembles the type in color, though it is sometimes of a deeper shade of lilac with less pink, and, like the double white variety, it produces flowers 3 to 4 inches in diameter. It may be noted, however, that the double-flowering varieties produce fewer flowers than the type which is single. The double lilac form is rather common in cultivation throughout Alta Vera Paz, but I have never seen it wild."

49329 and 49330. PERSEA SCHIEDEANA Nees. Lauraceæ. Coyó.

49329. "(No. 240. Coban, Alta Vera Paz. December 27, 1919.) *Vera Paz.* Cuttings of a superior variety of the coyó from the property of Padre Rivera in Tactic. An illustration of the fruit may be seen in Department Bulletin No. 743, 'The Avocado in Guatemala,' plate 13; in this plate an ordinary coyó is shown on the right, and the Vera Paz variety (as I suggest it be called) appears on the left. It is the finest coyó I have seen, and I recommend it strongly for trial in southern Florida and southern California, since I have come more and more to feel that the coyó, in its finer varieties, is a fruit of even better flavor than the avocado. Unfortunately, this species has never been given horticultural attention, and doubtless much remains to be done before it can take a place in our orchards alongside the avocado. The first step, certainly, is to secure the best available varieties, and I feel sure that the *Vera Paz* is one of them, for I have searched through the territory in which this fruit is abundant and I have found none better. Its pear-shaped fruits weigh about a pound and have a thick, leathery skin, ivory-white flesh containing much oil and with a rich, coconutlike flavor, and a seed about the same size as that of our best avocados.

"The coyó probably does not come into bearing as young as the avocado, and as a rule it is not so productive in old age; but varieties which will be satisfactory in this latter respect can probably be obtained. I am inclined to believe also that the fruit from young trees may be much inferior in quality to that from old ones. These points and several others must be determined by a trial in the United States and elsewhere. Since the tree occurs in Guatemala at altitudes ranging from 300 to 6,000 feet, it seems probable that the species will succeed in cool regions, like southern California and southern Florida, as well as in warm ones, like Cuba and Porto Rico."

49330. "(No. 241. Coban, Alta Vera Paz. December 27, 1919.) *Hempstead.* This variety has been called to my attention by Robert W. Hempstead, after whom I suggest it be named. The parent tree is growing in a small finca along the road from Coban to San Cristobal Vera Paz, and the fruit, which I have not seen,

49325 to 49334—Continued.

is described as large and of excellent quality. It is said to be pear shaped, somewhat slender, up to about 2 pounds in weight, with ivory-white flesh free from fiber and of excellent quality in every way. The parent tree is probably 50 years old, if not more; it is about 50 feet high and is said to be productive; at the time this budwood was cut (Dec. 26) it was in flower. The season of ripening is August and September.

"In this variety and the previous one (Vera Paz) I believe we have two coyós of as good quality as can be obtained, and with them as a beginning I believe it will be readily possible to develop from this species a fruit new to horticulture and of great value for tropical and subtropical regions."

49331. RUBUS ADENOTRICHOS Schlecht. Rosaceæ. **Blackberry.**

"(No. 243*a*, Coban, Alta Vera Paz. December 27, 1919,) Probably the best wild blackberry of Alta Vera Paz. It is not, however, so distinct from the cultivated berries of the North as to make it of great interest to northern horticulturists. It is a vigorous species, making a bush about 10 feet high and fruiting fairly profusely. The fruits are three-quarters of an inch to an inch in length and in flavor and color not distinguishable from some of the cultivated blackberries. In Kekchi it is, along with two or three other species, called *tokán*; in Spanish *mora*."

49332. RUBUS GLAUCUS Benth. Rosaceæ. **Andes berry.**

"(No. 244*a*. Coban, Alta Vera Paz. December 27, 1919.) *Tokán uuk* (Kekchi); *mora* (Spanish). The most remarkable Rubus of Vera Paz and one which seems to possess unusual promise. It can best be likened to the loganberry in character, yet its flavor is more nearly that of the red raspberry. Because of the large size of the fruits and their excellent quality it merits a careful trial in the United States.

"In habit the plant is suberect or even trailing, and it makes little wood. The canes sometimes reach 10 to 15 feet in length. The stems and lower surfaces of the leaves are silvery white, by which means it is easy to distinguish the species from the others which occur in Alta Vera Paz. Compared to most of them it is rare. The leaves are trifoliolate, with lanceolate to elliptic leaflets, long-acuminate and sharply serrate. The flowers are white, in panicles up to 6 inches long. The fruits vary from round to oblong in form and are often an inch in length; in cultivation they would quite likely be even larger.

"The wild plants are not very productive, but their productiveness could be increased greatly by proper pruning. The fruit is not borne at the ends of the canes but upon short fruiting laterals, and pruning would increase the number of these.

"By the Indians of Vera Paz this is esteemed as the finest of the wild species of Rubus, an esteem to which it seems fully entitled. The plant is found occasionally along roadsides and in the edge of scrub. It likes a heavy soil and plenty of moisture."

49333. RUBUS URTICAEFOLIUS Poir. Rosaceæ. **Blackberry.**

"(No. 242*a*. Coban, Alta Vera Paz. December 27, 1919.) *Tokán yak* (Kekchi); *mora* (Spanish), a wild blackberry abundant in Alta Vera Paz at altitudes of 3,000 to 5,000 feet. It is a robust and vigorous

49325 to 49334—Continued.

species, the most productive of those which occur in Vera Paz. It is readily distinguishable from the others by its stout canes, densely clothed with soft red spines.

"The plant forms a more or less compact bush up to 15 feet in height. The leaves have three or five oblong-ovate, shortly acuminate, finely serrate leaflets. The fruits, which are produced in terminal panicles 4 to 8 inches long, are about half an inch in length, oblong to ovate in outline, composed of numerous drupelets smaller than those of the cultivated blackberries. The color of the ripe fruit is nearly black; when immature it is wine colored. The sweet flavor somewhat resembles that of the blackberry. The juice is abundant, and the seeds are small and not hard.

"Because of its vigorous habit of growth, its productiveness, and the high quality of the fruit this species deserves a trial in the southern and southwestern United States."

For previous introduction, see S. P. I. No. 45356.

49334. ZEA MAYS L. Poaceæ. Corn.

"(No. 245*a*. Coban, Alta Vera Paz. December 27, 1919.) 'Cold country' corn, as it is called here; long slender ears of flint corn, produced in the vicinity of Coban, probably at an altitude of about 4,000 feet. Of interest to those engaged in the study or breeding of corn."

49335. BELOU MARMELOS (L.) Lyons. Rutaceæ. **Bel.**
(*Aegle marmelos* Correa.)

From Honolulu, Hawaii. Seed presented by Dr. H. L. Lyon, department of botany and forestry, Hawaiian Sugar Planters' Experiment Station. Received March 12, 1920.

"Variety *subglobosa*." (*Lyon.*)

A good-sized tree with ash-colored bark; few irregular branches, often with sharp, strong spines; and densely pubescent trifoliolate leaves. It is commonly cultivated throughout India and ascends the mountains to about 4,000 feet. The wild variety has a far inferior fruit. The wood is light colored and variegated, compact and hard. A native drum is made from it, and in some parts it is used for the hubs of wheels and for sugar crushers. The juice of the fruit makes a delicious sherbet, and is much esteemed in Bengal as a hot-weather beverage. The bark, roots, and fruit are used medicinally by the natives. (Adapted from *Beddome, Flora Sylvatica, pl. 161.*)

For previous introduction, see S. P. I. No. 46477.

49336 to 49339. SACCHARUM OFFICINARUM L. Poaceæ.
Sugar cane.

From Cienfuegos, Cuba. Seeds presented by Robert M. Grey, Harvard Botanical Station. Received January 29, 1920. Quoted notes by Mr. Grey.

49336. "Harvard Seedling 144."

49337. "Harvard Seedling 4124. Immune to mottling."

49338. "Harvard Seedling 6047. High in sugar, averaging from 19 to 20 per cent sucrose in our own hand-mill analyses."

49339. "Harvard Seedling 6098."

49340. CASTANOPSIS HYSTRIX A. DC. Fagaceæ.

From Darjiling, India. Seeds presented by G. H. Cave, curator, Lloyd Botanic Garden. Received March 18, 1920.

A low evergreen tree with wide-spreading branches, fairly common at low altitudes on Mount Omei, Szechwan, and in the surrounding country. The contrast between the rufous-brown young leaves and the shining green upper surfaces of the older leaves is striking. (Adapted from *Sargent, Plantae Wilsonianae, vol. 3, pt. 1–2, p. 197.*)

49341. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Cienfuegos, Cuba. Seeds presented by Robert M. Grey, Harvard Botanical Station. Received January 29, 1920.

"High in sugar, averaging from 19 to 20 per cent sucrose in our own hand-mill analyses." (*Grey.*)

49342. TRITICUM AESTIVUM L. Poaceæ. **Wheat.**
(*T. vulgare* Vill.)

From New South Wales. Seed obtained through J. W. T. Duvel, United States Grain Corporation, New York. Received January 31, 1920.

Roseworth. [This is the name of an agricultural station in New South Wales. No description of this variety is at present available.]

49343. ROSA LAXA Retz. Rosaceæ. **Rose.**

From Elstree, Herts, England. Seeds presented by Hon. Vicary Gibbs, Aldenham House Gardens. Received January 31, 1919.

A beautiful single rose, native to the Altai Mountains and central Siberia. It has arching stems, seven to nine oblong, serrate leaflets, and very attractive white or pink flowers which are borne singly or in twos or threes. The globose pulpy fruits are bright red. (Adapted from *Willmott, The Genus Rosa, pt. 8, pl. 53.*)

For previous introduction, see S. P. I. No. 47161.

49344. HAEMATOSTAPHIS PIERREANA Engl. Anacardiaceæ.

From Lambarene, Gabon, French Equatorial Africa. Seeds presented by Edward A. Ford, Société des Missions Evangéliques de Paris. Received January 31, 1920.

"Seeds of a native fruit which I saw for the first time only recently. It has a very acrid taste, but makes excellent jam. I have not seen the tree; the name given me by the Fang people is *fogo*. It may be the same as the *ofos, Pseudospondias longifolia* (*Haematostaphis pierreana*), but I am not sure." (*Ford.*)

A tall tree with dense foliage composed of unequally pinnate membranous leaves over a foot in length. The fruit is ovoid with a thick layer of flesh, and is about an inch in length. (Adapted from *Engler, Botanische Jahrbücher, vol. 36, p. 219.*)

49345. COIX LACRYMA-JOBI L. Poaceæ. **Job's-tears.**

From Hangchow, Chekiang, China. Seeds collected by O. F. Cook, of the Bureau of Plant Industry, United States Department of Agriculture. Received February 2, 1920.

"A form of Job's-tears with somewhat flattened seeds." (*Cook.*)

49346 to 49349. GOSSYPIUM sp. Malvaceæ. **Cotton.**

From Lima, Peru. Bolls presented by James H. Roth, American vice consul in charge. Received March 1, 1920. Quoted notes by Mr. Roth.

"Rough cotton, sometimes known as vegetable wool, cultivated a few miles inland from the port of Payta, in the vicinity of Catacaos, valley of the Piura River, Peru. These forms are practically identical with those that have been discovered in prehistoric graves where they were buried with the mummies."

49346. "White bolls. Samples of the best kind of rough Peruvian cotton grown in the Piura-Payta section of the country."

49347. "*Mestizo*, naturally colored."

49348. "*Pardo*, brown and maroon or purplish."

49349. "*Duro*. Undeveloped boll, having been stung by an insect known here as 'rabi-atado,' a plague which is doing enormous damage in this province."

49350. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Georgetown, Demerara, British Guiana. Seeds presented by R. Ward, superintendent, Botanic Gardens. Received February 4, 1920. *Demerara No. 108*

49351 to 49356. MANIHOT ESCULENTA Crantz. Euphorbiaceæ. (*M. utilissima* Pohl.) **Cassava.**

From Barbados, British West Indies. Cuttings presented by John R. Bovell, Director of Agriculture. Received August 12, 1919, grown in quarantine, and numbered in March, 1920.

Introduced for testing in Porto Rico and Hawaii.

49351. *Friendship.*
49352. *Helada.*
49353. *Trinidad No. 1.*
49354. *Trinidad No. 2.*
49355. *Trinidad No. 3.*
49356. *White Greenaway.*

49357. PHYLLOSTACHYS MITIS (Lour.) A. and C. Rivière. Poaceæ. **Bamboo.**

From Nice, France. Rhizomes presented by Dr. A. Robertson Proschowsky. Received February 5, 1920.

"As concerns the bamboo, it is the tallest species of those commonly cultivated here, and the culms usually attain a height of 10 to 12 meters, rarely more. It is an exceedingly hardy species and a very useful plant, the culms being strong and quite straight. Prof. Trabut, of Algiers, expressed the opinion that this bamboo is the most useful also in Algeria." (*Proschowsky.*)

49358 and 49359. MANIHOT ESCULENTA Crantz. Euphorbiaceæ. (*M. utilissima* Pohl.) **Cassava.**

From Barbados, British West Indies. Cuttings presented by John R. Bovell, Director of Agriculture. Received August 12, 1919, grown in quarantine, and numbered in March, 1920.

Introduced for testing in Porto Rico and Hawaii.

49358. *B. 101.*
49359. *Blue Top.*

49360 to 49363. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Antigua, British West Indies. Seeds presented by Arnold W. Gallwey, acting curator and agricultural superintendent. Received February 6, 1920.

49360. *B. 3412.*
49361. *B. 4596.*
49362. *D. 74.*
49363. *D. 109.*

49364 and 49365.

From Blackwood, South Australia. Seeds presented by Edwin Ashby, "Wittunga." Received February 9, 1920. Quoted notes by Mr. Ashby.

49364. GREVILLEA BUXIFOLIA (J. E. Smith) R. Br. Proteaceæ.

"A native of New South Wales, where it grows on rough, sandy land, but it makes a nice shrub in my garden, about 6 feet high. It will stand hard cutting. It flowers freely, the flowers being rather more interesting than showy. All the flowers are clothed with silky hairs. It should do well in California."

49365. GREVILLEA LAVANDULACEA Schlecht. Proteaceæ.

"A native of South Australia, where it grows from a foot to 18 inches high on a sandy or clayey subsoil, but it seems to prefer broken rocky soil (quartzite). It does very well on rockeries and should be treated as a rock plant (dwarf, hard-wooded shrub). It produces a mass of pink flowers from the beginning of our winter until late spring. It should do well in California, where it will be an acquisition to those who have rock gardens."

For previous introduction, see S. P. I. No. 47189.

49366 and 49367. RICINUS COMMUNIS L. Euphorbiaceæ. Castor-bean.

From Huatabampo, Sonora, Mexico. Seeds presented by J. R. Uribe, Hacienda Delia, Rio Mayo. Received February 9, 1920.

"Samples of the beans which grow wild here." (*Uribe.*)

49366. Seeds 18 mm. long by 15 mm. wide; light gray with a few brown markings.

49367. Seeds 15 mm. long by 8 mm. wide; light gray, mostly overlaid with dark-brown markings.

49368. FESTUCA HOOKERIANA F. Muell. Poaceæ. Grass.

(*Schedonorus hookerianus* Benth.)

From Sydney, New South Wales. Seeds presented by George Valder, undersecretary and director. Received February 9, 1920.

A stout perennial grass, 2 to 4 feet in height, indigenous to New South Wales, Victoria, and Tasmania. It has flat, rather long leaves, very loose panicles up to a foot in length, and rigid flowering glumes. It stands mowing and pasturing well and is relished by stock. (Adapted from *Maiden, Useful Native Plants of Australia, p. 107,* and *Bentham, Flora Australiensis, vol. 7, p. 656.*)

49369. GLADIOLUS MALANGENSIS Baker. Iridaceæ. Gladiolus.

From Ochileso, Angola, West Africa. Bulbs presented by H. A. Neipp, American Mission. Received February 6, 1920.

A West African gladiolus from 1 to 2 feet in height, with three or four erect, linear, rigid leaves and a simple or branched inflorescence. The deep-red flowers are borne in loose spikes 4 to 6 inches long. (Adapted from *Bulletin de l'Herbier Boissier, 2d ser., vol. 1, p. 867.*)

49370 to 49383.

From Guatemala. Collected by Wilson Popenoe, Agricultural Explorer for the Bureau of Plant Industry. Received February 9, 1920. Quoted notes by Mr. Popenoe.

49370 to 49383—Continued.

49370. ANANAS SATIVUS Schult. f. Bromeliaceæ. Pineapple.

"(No. 266. Tucuru, Alta Vera Paz. January 12, 1920.) Suckers of a variety of pineapple from Tucuru at an altitude of about 3,200 feet. It is known to the few Americans in this region as the 'sugar-loaf' pineapple because of its sweetness. It is described by R. W. Hempstead, through whose courtesy I have obtained these suckers, as broadly oval, large, with white, very juicy, sweet-flavored flesh."

49371. ANNONA SCLERODERMA Safford. Annonaceæ.

"(No. 249a. Tucuru, Alta Vera Paz. January 12, 1920.) *Posh* (Kekchi); Spanish orthography *pox*, sometimes called in English 'hard-shelled custard-apple.' Seeds of a rare species of Annona from Chama, on the Rio Chixoy; altitude 950 feet.

"In size of tree and habit of growth this species resembles *Annona reticulata*. In foliage, however, it is quite distinct. The leaves are oblong to oblong-lanceolate, 6 to 9 inches long, 2¼ to 3 inches broad, shortly acuminate, coriaceous, deep green and almost glossy above, paler beneath.

"The fruits, which are borne on stout stalks about an inch long, are broadly heart-shaped to round and up to 4 inches in diameter. The surface, which is dull gray-green, differs in character from that of most other Annonas: it is divided by prominent ridges into irregularly pentagonal areas. The skin or outer covering is nearly a quarter of an inch thick and coarsely granular in texture. It forms a brittle shell which effectively protects the flesh and makes it possible for the ripe fruit to be handled roughly without injury to the flesh. The latter, which is snow-white and divided into loosely cohering segments each containing a seed the size of a bean, is of remarkably pleasant flavor suggesting that of the sugar-apple (*A. squamosa*), with a dash of lemon. Many Annonas are heavily sweet or mawkish; not so the *posh*. It has sufficient acidity (more than the cherimoya) to give it sprightliness, and it never cloys the palate.

"The trees which I have seen at Chama are more productive than the average cherimoya. The species may well be compared to *Annona squamosa* in fruiting habit. Abortive fruits, such as many of those borne by most cherimoya trees, are rarely produced, but there is considerable variation in the size. The average is about 3 inches in diameter.

"This species evidently belongs to the tropical lowlands; hence, in the United States, it is likely to succeed only in southern Florida."

For previous introduction, see S. P. I. No. 40835.

49372. CHAETOCHLOA PANICULIFERA (Steud.) Hitchc. Poaceæ. Grass.
(*Setaria paniculifera* Fourn.)

"(No. 258*a*. Tucuru, Alta Vera Paz. January 12, 1920.) *Hotz kor* (Kekchi). Seeds collected near Chama. This plant is found commonly throughout Alta Vera Paz, where it is considered one of the best forage grasses. It is thought to be more nourishing than most other grasses, and both horses and cattle eat it readily in spite of the fact that the leaves are covered with somewhat coarse hairs which it might be expected would prove disagreeable to animals.

"*Hotz kor* never forms pastures or solid stands over large areas, but usually grows on slopes or among scrub, where it forms scattered clumps.

49370 to 49383—Continued.

sending up leaves to a height of 4 to 6 feet and flower stalks sometimes 6 or 7 feet above the ground. It is a perennial, and I am told by R. W. Hempstead that it will stand four cuttings a year. It seems particularly adapted to moist regions and for this reason is recommended for trial in the Everglades of Florida."

49373. CHAMAEDOREA sp. Phœnicaceæ. **Pacayito.**

"(No. 271. Tucuru, Alta Vera Paz. January 18, 1920.) *Pacayito*, called *kok kib* in Kekchi, a handsome dwarf palm found under dense forest in several parts of Vera Paz. It appears to occur only in regions where there are limestone outcroppings. These plants were collected on the Finca Los Alpes."

49374. CROTALARIA SAGITTALIS L. Fabaceæ.

"(No. 252*a*. Tucuru, Alta Vera Paz. January 12, 1920.) Seeds of a species growing to about 18 inches in height collected at Finca Samac, near Coban. It should be tested in the South as a cover crop. In Kekchi it is called *tzok tzok xul*."

49375. JUGLANS sp. Juglandaceæ. **Walnut.**

"(No. 265*a*. Tucuru, Alta Vera Paz. January 12, 1920.) Nuts of the *nogal* or native black walnut tree. It is occasionally seen in cultivation but more commonly wild. It makes a shapely tree up to 50 feet in height and yields nuts much like those of *Juglans nigra* but with a thicker shell. Its wood is considered valuable."

49376. PANICUM HIRSUTUM Swartz. Poaceæ. **Grass.**

"(No. 257*a*. Tucuru, Alta Vera Paz. January 12, 1920.) A forage grass, 3 feet high, said to be of good quality. Collected from the roadside near Chama, Alta Vera Paz."

49377. PASPALUM PANICULATUM L. Poaceæ. **Grass.**

"(No. 252*a*. Tucuru, Alta Vera Paz. January 12, 1920.) A pasture grass from the Finca Samac, near Coban. The plant grows to about 2 feet in height and apparently spreads by seeds only. As forage it is considered very good."

49378. PASPALUM CANDIDUM (Humb. and Bonpl.) Kunth. Poaceæ. **Grass.**

"(No. 263*a*. Tucuru, Alta Vera Paz. January 12, 1920.) *Kah tut*. A pasture grass from the Finca Samac, near Coban. It grows about 18 inches in height and is very abundant in the edges of the coffee plantation, where it often forms solid stands. It is cut for feeding to stock and is considered very good for this purpose."

49379. PASPALUM PANICULATUM L. Poaceæ. **Grass.**

"(No. 256*a*. Tucuru, Alta Vera Paz. January 12, 1920.) A grass, growing to about 3 feet in height, found near Chama, on the Rio Chixoy. Said to be a good forage grass."

49380. PASPALUM PLICATULUM Michx. Poaceæ. **Black grass.**

"(No. 261*a*. Tucuru, Alta Vera Paz. January 12, 1920.) A common pasture grass from the Finca Samac, near Coban. This species grows to about 15 inches in height, and its leaves, though rather small, are abundant."

For previous introduction, see S. P. I. No. 47049.

49370 to 49383—Continued.

49381. PENNISETUM COMPLANATUM (Nees.) Hemsl. Poaceæ. Grass.

"(No. 259*a*. Tucuru, Alta Vera Paz. January 12, 1920.) *Kux kub.* Seeds of a foxtail occurring in pastures of Finca Samac, near Coban, Alta Vera Paz. It grows about 3 feet high and is said to be good forage."

49382. PENNISETUM DISTACHYUM (Fourn.) Rupr. Poaceæ. Grass.

"(No. 260*a*. Tucuru, Alta Vera Paz. January 12, 1920.) *Xul aj.* Seeds of a large grass occurring along ravines and in half-shady places, Finca Samac, near Coban. It grows to 6 feet in height, with leaves an inch broad, and seeds abundantly. It looks like a valuable forage grass."

49383. PERSEA DONNELL-SMITHII Mez. Lauraceæ.

"(No. 248*a*. Tucuru, Alta Vera Paz. January 12, 1920.) *Oh-mash* (Kekchi, for 'monkey avocado'). A wild species of Persea found in the valley of Tactic (where these seeds were obtained) and abundantly on the mountains between Tactic and Coban, principally in open places.

"This is a slender tree up to 40 feet in height (commonly about 25 feet), with large oblong-obovate leaves, reddish pubescent beneath, and small terminal panicles of black fruits the size and shape of peas. While its fruit is not edible or useful in any way, the species is of interest as a relative of the avocado and may have value as a stock for the latter, especially for wet lands. Its degree of frost resistance is unknown, but the fact that it occurs in the zone of the Guatemalan avocado indicates that it will probably be as hardy as the latter and maybe even hardier."

49384. CALLILEPIS sp. Asteraceæ.

From Nelspruit, Transvaal. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received January 29, 1920.

"(No. 186. Nelspruit, Transvaal. October 20, 1920.) A composite about 10 to 14 inches high, with almost white chrysanthemumlike flowers." (*Shantz.*)

49385 to 49401.

From Guatemala. Collected by Wilson Popenoe, Agricultural Explorer for the Bureau of Plant Industry. Received February 9, 1920. Quoted notes by Mr. Popenoe.

49385. POLYGALA FLORIBUNDA Benth. Polygalaceæ. Chupak.

"(No. 268*a*. Tucuru, Alta Vera Paz, January 18, 1920.) *Chupak.* Seeds of a handsome shrub, wild and cultivated in Vera Paz. It sends up stems about 6 feet in height, each one terminating in a large loose panicle of purplish flowers. Since it is of easy culture and blooms nearly all the year it is considered a desirable ornamental by Europeans in this region. Its roots are used in place of soap. Presented by Mrs. Gustavo Helmrich, of Finca Samac, near Coban."

For previous introduction, see S. P. I. No. 44683.

49386. RANDIA ACULEATA L. Rubiaceæ.

"(No. 269*a*. Tucuru, Alta Vera Paz. January 18, 1920.) Seeds of a shrub which I have seen only in the vicinity of Purula, Baja Vera Paz. It grows in the edge of the forest, occasionally in the open, and seems to thrive on lots of moisture. It is interesting because of its formal appearance and symmetrical growth, which strongly resembles Buxus. It should make an excellent hedge plant and for specimen plants in a

49385 to 49401—Continued.

formal garden should be very attractive. It reaches about 10 feet in height, and its slender branches are clothed with small leaves arranged in clusters. The fruits, which are white when ripe, round, and about half an inch in diameter, increase the ornamental appearance of the plants."

49387. RUBUS GLAUCUS Benth. Rosaceæ. **Andes berry.**

"(No. 250*a*. Tucuru, Alta Vera Paz. January 12, 1920.) *Tokán uuk.* Seeds collected near Santa Cruz, Alta Vera Paz. See No. 244*a* [S. P. I. No. 49332] for description."

49388. RUBUS sp. Rosaceæ. **Blackberry.**

"(No. 255*a*. Tucuru, Alta Vera Paz. January 12, 1920.) *Tokán.* Seeds of a good blackberry found near Santa Cruz, Vera Paz. Probably the same as No. 243*a* [S. P. I. No. 49331], but the fruits are not quite as sweet as those of the plant from which the latter seed was obtained."

49389. SALVIA POPENOEI Blake. Menthaceæ. **Sage.**

"(No. 254*a*. Tucuru, Alta Vera Paz. January 12, 1920.) *Tutz unûn* (Kekchi). Seeds of a handsome plant found along the roadside between Tactic and Purula. It grows commonly 3 to 5 feet high and bears terminal spikes of bright crimson-scarlet flowers somewhat richer in color than those of *Salvia splendens*."

49390 to 49399. ZEA MAYS L. Poaceæ. **Corn.**

49390. *No. 1.* Dark red.

49391. *No. 2.* Dark red, but lighter than No. 1.

49392. *No. 3.* Dirty white; kernels flat.

49393. *No. 4.* Dirty white; kernels square.

49394. *No. 5.* Dirty white with a tinge of yellow.

49395. *No. 6.* Yellow; kernels broad and flat.

49396. *No. 7.* Yellow; kernels longer and more square.

49397. *No. 8.* Lighter yellow than Nos. 6 or 7.

49398. *No. 9.* Light mulberry color with a few darker grains.

49399. *No. 10.* Dirty white with red streaks.

49400. COCCOSIPSILUM REPENS Swartz. Rubiaceæ.

"(No. 267*a*. Tucuru, Alta Vera Paz. January 18, 1920.) An interesting herbaceous plant found on moist slopes in Vera Paz. It creeps along the ground, making stems about 2 feet in length, and produces pale-blue flowers about half an inch broad, followed by bright-blue fruits in clusters of two or three, half an inch in diameter and very beautiful."

49401. PASPALUM FASCICULATUM Willd. Poaceæ. **Grass.**

"(No. 246. Tucuru, Alta Vera Paz. January 12, 1920.) *Ochoy*, a wet-land forage grass from Chama, on the Rio Chisoy, about 8 leagues from Coban. This plant makes excellent forage, being considered one of the very best. It grows vigorously, spreading by means of underground rhizomes, and sends up shoots ordinarily to a height of about 3 feet. It rarely flowers."

49402. PICEA sp. Pinaceæ. **Spruce.**

From Shansi, China. Seeds presented by Joseph Bailie, Berkeley, Calif. Received February 20, 1920.

A Chinese spruce of possible value as an ornamental or park tree.

49403. DIOSPYROS KAKI L. f. Diospyraceæ. **Kaki.**

From Paotingfu, Chihli, China. Cuttings presented by H. W. Robinson, American Board Mission. Received February 10, 1920.

Scions of the Japanese persimmon for propagation experiments in this country.

49404. SOLANUM sp. Solanaceæ.

From Ciudad Lerdo, Durango, Mexico. Tubers presented by Dr. Ellswood Chaffey. Received March 2, 1920.

Wild potato tubers requested for experimental purposes.

49405. DATURA SANGUINEA Ruiz and Pav. Solanaceæ.

From Monterey, Calif. Seeds presented by H. A. Greene, Monterey Tree-Growing Club. Received February 14, 1920.

"A large, treelike Peruvian plant, extending in its native land to altitudes where heavy frosts are encountered every night. It is somewhat smaller than *Datura arborea*, with smaller leaves and more narrowly tubular flowers. The corolla tube is green at the base, orange-yellow in the middle, and scarlet at the mouth." (*O. F. Cook.*)

For previous introduction see S. P. I. No. 41329.

49406. CHAMAEDOREA sp. Phœnicaceæ. **Pacayito.**

From Guatemala. Seeds collected by Wilson Popenoe, Agricultural Explorer for the Bureau of Plant Industry. Received February 14, 1920.

"(No. 271*a*. Tucuru, Alta Vera Paz. January 18, 1920.) *Pacayito.* See No. 271 [S. P. I. No. 49373] for notes. These seeds were collected from plants in the forest at Finca Los Alpes." (*Popenoe.*)

49407 and 49408.

From Mayaguez, Porto Rico. Seeds presented by T. B. McClelland, horticulturist, Agricultural Experiment Station. Received February 12, 1920.

49407. DESMANTHUS VIRGATUS (L.) Willd. Mimosaceæ.

A white-flowered woody plant, common in many places in the West Indies. The leaves, which are sensitive, are bipinnate, and the pods are linear-compressed. In Jamaica the brown polished seeds are used for beads. (Adapted from *Grisebach, Flora of the British West Indies, p. 218*, and *Lindley, Treasury of Botany, vol. 1, p. 394.*)

49408. MIMOSA CERATONIA L. Mimosaceæ.

A vinelike shrub, 2 to 5 meters high, found in many places in the West Indies. The branches and stems are covered with small recurved prickles, and the flowers are borne in globose heads. (Adapted from *Grisebach, Flora of the British West Indies, p. 219.*)

49409. AMYGDALUS DAVIDIANA (Carr.) Zabel. Amygdalaceæ.
(*Prunus davidiana* Franch.) **Peach.**

From Sacaton, Ariz. Seeds presented by S. H. Hastings, director, Agricultural Experiment Station, through Prof. S. C. Mason, of the Bureau of Plant Industry. Received February 21, 1920.

"One of the trees of *Amygdalus davidiana* differed so strikingly from the others that I made special note of it. The top was more round and open, the

branches thicker, more rigid, and the small twigs thicker and shorter and decidedly less willowy than in the ordinary type. The leaves were broader than usual, less acuminate, and with coarser marginal serrations. The fruits were unusually large with flesh unusually thick and soft and of a more downy appearance than those of the usual type." (*Mason.*)

49410. RHEUM sp. Polygonaceæ. **Rhubarb.**

From Tatsienlu, Szechwan, China. Seeds presented by Dr. C. Glass Davitt, College of Yale in China, Changsha, China. Received February 21, 1920.

"Tibetan wild rhubarb seed. Tatsienlu. West China. October, 1919." (*Davitt.*)

Obtained for breeding experiments.

49411. CYNODON INTERMEDIUS Rang. and Tad. Poaceæ. **Grass.**

From Coimbatore, Madras, India. Seeds presented by C. Tadulingam, assistant lecturing botanist, Agricultural College, through C. V. Piper, Bureau of Plant Industry. Received February 21, 1920.

A widely creeping perennial grass, rooting at the nodes; leafy, with slender erect or ascending flowering branches, which vary in length from 12 to 18 inches. The leaf blades are linear, flat, and up to 7 inches in length. This grass is a native of the Nilgiri Hills, southwestern India. It is intermediate between *Cynodon dactylon* and *C. barberi*, differing from the former principally in not having underground stems and from the latter in being more extensively creeping and with longer and more slender branches. (Adapted from *Journal of the Bombay Natural History Society, vol. 26, p. 304.*)

49412 to 49431. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From Edinburgh, Scotland. Tubers presented by the secretary, Board of Agriculture. Received February 25, 1920.

The following varieties are introduced for experiments being carried on by the Bureau of Plant Industry to obtain varieties resistant to the wart disease.

49412. *America.*
49413. *Arran Comrade.*
49414. *Arran Victory.*
49415. *The Bishop.*
49416. *Dargill Early.*
49417. *The Duchess.*
49418. *Edsell Blue.*
49419. *Epicure.*
49420. *Immune Ashleaf.*
49421. *Irish Queen.*
49422. *Lochar.*
49423. *Majestic.*
49424. *Mauve Queen.*
49425. *May Queen.*
49426. *Midlothian Early.*
49427. *Nithscale.*
49428. *Resistant Snowdrop.*
49429. *Rhoderick Dhu.*
49430. *Sharpe's Express.*
49431. *Tinwald Perfection.*

49432. SORBUS TORMINALIS (L.) Crantz. Malaceæ.

From Borde Hill, Cuckfield, Sussex, England. Plants presented by Col. Stephenson R. Clarke. Received February 25, 1920.

A fine large tree, native to southern and central Europe. The dark-green leaves, rather variable in shape and size, turn yellow and red in autumn, and the white flowers are borne in June in rather lax corymbs about 4 inches in diameter. The reddish yellow roundish fruits are sometimes eaten when very ripe. (Adapted from *Hempel and Wilhelm, Bäume und Sträucher, vol. 3, p. 81, pl. 53.*)

49433 to 49440. CORYLUS AVELLANA L. Betulaceæ. **Filbert.**

From Maidstone, England. Plants purchased from George Bunyard & Co. Received February 26, 1920. Quoted notes taken from Bunyard's Catalogue, 1915–16, p. 32.

49433. "*Cosford.* Nut almost round, large, most excellent flavor, and very thin shell. A prolific variety and recommended as a pollenizer for less fertile sorts."

49434. "*Duke of Edinburgh.* Nut large, oblong; shell rather thick; of excellent flavor."

49435. "*Early Prolific.* Curiously frizzled husk; nuts small but produced in large clusters, often 10 to a bunch; very early, sweet, and good. Sometimes called the Frizzled nut."

49436. "*Kentish.* Nut long, pointed, very sweet and delicate. Of great antiquity, having been grown in Kent for a long period. Has been almost superseded, on account of its infertility, by the Kentish Cob."

49437. "*Kentish Cob.* Nut large, broad, and long; excellent flavor; prolific; the best for all-round use. Almost exclusively grown in Kent for market."

49438. "*Kentish Cob.*" [Nuts only were received of this variety.]

49439. "*Pearson's Prolific.* Nut round, short, good flavor; an abundant and early bearer; produces large quantities of catkins and is valuable for purposes of cross-fertilization."

49440. "*Webb's Prize Cob.*"

49441. GARCINIA MANGOSTANA L. Clusiaceæ. **Mangosteen.**

From Buitenzorg, Java. Seeds presented by the director, Botanic Gardens. Received February 28, 1920.

This delicious fruit is about the size of a mandarin orange, round and slightly flattened at each end, with a smooth, thick rind, rich red-purple in color. This rind incloses the pulp segments, five to seven in number, between snow white and ivory in color with the texture of a well-ripened plum and a most delicious flavor.

For previous introduction, see S. P. I. No. 47120.

49442. CEIBA PENTANDRA (L.) Gaertn. Bombacaceæ. **Kapok.**
(*Eriodendron anfractuosum* DC.)

From Buitenzorg, Java. Seeds presented by G. F. J. Bley. Received February 28, 1920.

"The kapok tree is widely distributed in the Tropics of both hemispheres and attains a height of 75 to 100 feet, with wide-spreading horizontal branches. When about 5 years old it begins to bear pods with kapok down, the yield increasing with the age of the tree. Well-developed trees yield annually about 7,000 pounds per acre under favorable conditions. Kapok is excellent for pillows, mattresses, life preservers, etc., and its use is constantly increasing." (*L. H. Dewey.*)

For previous introduction, see S. P. I. No. 46522.

49443 to 49456.

From Guatemala. Seeds collected by Wilson Popenoe, Agricultural Explorer for the Bureau of Plant Industry. Received February 28, 1920. Quoted notes by Mr. Popenoe.

49443 to 49456—Continued.

49443. ALPINIA sp. Zinziberaceæ.

"(No. 282*a*. Tucuru, Alta Vera Paz. January 19, 1920.) From Chama, Alta Vera Paz. A plant which resembles *Alpinia nutans* in foliage and produces close to the ground large numbers of bright-red fruits about an inch long, containing small hard seeds surrounded by a mucilaginous pulp, much used by the Kekchi Indians as an ingredient of soups and stews. Kekchi name *tzih*."

49444. AMARANTHUS sp. Amaranthaceæ.

"(No. 283*a*. Tucuru, Alta Vera Paz. January 19, 1920.) From the Finca Mocca; altitude 3,500 feet. An annual cultivated in Alta Vera Paz for its small black seeds, which are toasted and ground and used to make sweetmeats. The plant grows about 3 feet high and bears crimson flower heads."

49445. GYNANDROPSIS SPECIOSA (H. B. K.) DC. Capparidaceæ.

"(No. 281*a*. Tucuru, Alta Vera Paz. January 19, 1920.) Presented by Harry Johnson. An annual about 3 feet high with red flowers."

49446. HOMOLEPIS ATURENSIS (H. B. K.) Chase. Poaceæ. Grass.
(*Panicum aturense* H. B. K.)

"(No. 273*a*. Tucuru, Alta Vera Paz. January 19, 1920.) A good pasture grass from the Finca Los Alpes; altitude 3,000 feet. It grows about 15 inches high and is said to be very nourishing."

49447. ISACHNE ABUNDINACEA (Swartz) Griseb. Poaceæ. Grass.

"(No. 274*a*. Tucuru, Alta Vera Paz. January 19, 1920.) A pasture grass from Finca Mocca; altitude about 3,500 feet. Perhaps too tough to be of great value. It grows about 2 feet high."

49448. LASIACIS OAXACENSIS (Steud.) Hitchc. Poaceæ. Grass.
(*Panicum oaxacense* Steud.)

"(No. 277*a*. Tucuru, Alta Vera Paz. January 19, 1920.) A tall grass (about 4 feet) from the Finca Mocca. It makes abundant foliage and loose heads of large seeds."

49449. MANDEVILLA AURICULATA (Pohl.) Schum. Apocynaceæ.

"(No. 279*a*. Tucuru, Alta Vera Paz. January 19, 1920.) Presented by Harry Johnson. A climbing plant from Chama, Alta Vera Paz, reaching a height of 30 feet. Its flowers are funnel shaped, 2 inches across the top, and creamy white with a strawberry-red throat."

49450. PANICUM GLUTINOSUM Swartz. Poaceæ. Grass.

"(No. 276*a*. Tucuru, Alta Vera Paz. January 19, 1920.) A grass found in the edges of the coffee plantation at Finca Mocca. It grows about 4 feet high."

49451. PASPALUM VIRGATUM L. Poaceæ. Grass.

"(No. 275*a*. Tucuru, Alta Vera Paz. January 19, 1920.) A tall grass from Finca Los Alpes. It makes coarse leaves and produces large heads of seed. It is not considered as good as some other grasses in this region."

For previous introduction, see S. P. I. No. 47050.

49452. PASSIFLORA SERRATIFOLIA L. Passifloraceæ.

"(No. 278*a*. Tucuru, Alta Vera Paz. January 19, 1920.) A vigorous climber from the hot country (low altitudes), producing round fruits

49443 to 49456—Continued.

up to 2 inches thick, lemon yellow, with translucent whitish flesh, which is subacid and of fairly pleasant flavor. The seeds are shaped like diminutive arrowheads. Presented by Harry Johnson."

49453. SOLANUM SEAFORTHIANUM Andrews. Solanaceæ.

"(No. 285*a*. Tucuru, Alta Vera Paz. January 19, 1920.) A climbing plant from the forest in the Finca Mocca, at an altitude of about 3,000 feet. It becomes about 20 feet in height, making slender stems and graceful foliage, and bears white flowers followed by decorative fruits, which are round, half an inch in diameter, and bright orange-red."

49454. INDIGOFERA sp. Fabaceæ.

"(No. 284*a*. Tucuru, Alta Vera Paz. January 19, 1920.) A small leguminous plant of semicreeping habit from the Finca Los Alpes; altitude 3,000 feet. It makes stems about 3 feet long and bears terminal spikes of salmon-pink flowers."

49455. VALOTA INSULARIS (L.) Chase. Poaceæ. Grass.

"(No. 286*a*. City of Guatemala. February 3, 1920.) A grass cultivated near El Progreso, in the hot country between the city of Guatemala and Zacapa. It grows to 6 or 7 feet in height, makes abundant foliage, and appears to be a good forage plant."

For previous introduction, see S. P. I. No. 47057.

49456. (Undetermined.)

"(No. 280*a*. Tucuru, Alta Vera Paz. January 19, 1920.) Presented by Harry Johnson. An herbaceous perennial from Chama, Alta Vera Paz, growing about a foot high and producing spikes of red flowers."

49457. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

From Honolulu, Hawaii. Seeds presented by J. M. Westgate, agronomist in charge, Agricultural Experiment Station. Received March 2, 1920.

"Seeds of a cross between the wild species and *Earliana*." (*Westgate.*)

49458. ASPARAGUS ACUTIFOLIUS L. Convallariaceæ.

From Hartsville, S. C. Seeds collected by J. B. Norton, Agricultural Explorer for the Bureau of Plant Industry. Received March 2, 1920.

"This is probably the hardiest evergreen species of the genus. Stock grown from S. P. I. No. 34620 has survived four winters at Hartsville, S. C., when the temperature has gone below 10° F. It makes a beautiful thickset hedge of a very dark green color, suggesting a fine-leaved juniper. As the plants grow older there is a tendency to produce vinelike shoots. The tuberlike storage roots and drought-resistant foliage make it valuable for regions of scanty rainfall. The shoots are edible, although much smaller than those of ordinary asparagus. The flavor, however, is said by some to be superior to that of the common species." (*Norton.*)

49459 to 49471.

From Kafue, Northern Rhodesia. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received March 2, 1920. Quoted notes by Doctor Shantz.

49459. BRACHYSTEGIA sp. Cæsalpiniaceæ.

"(No. 300. Bolenga Camp. November 25, 1919.) *Mombo* (Chimyanja). A large, spreading acacialike plant with large pods and large flat seeds,

49459 to 49471—Continued.

which are eaten by baboons and natives. The bast fiber was formerly used to make cloth; now used whenever fiber is required. A most useful as well as ornamental tree."

49460. CÆSALPINIA sp. Cæsalpiniaceæ.

"(No. 299. Bolenga Camp. November 25, 1919.) *Ucta* (Chimyanja). A small tree not over 10 feet high, bearing large pods, the beans of which are eaten after four successive boilings; the water is thrown off each time. The beans are said to kill if eaten after one boiling."

49461. CARYOPHYLLUS JAMBOS (L.) Stokes. Myrtaceæ. Rose-apple.
(*Eugenia jambos* L.)

"(No. 318. Kafue. December 4, 1919.) *Musafa* (in Mashakalumbwe and in Chimyanja). A beautiful light lemon-green fruit 1 inch in diameter, with a most agreeable spicy flavor; the seeds are large and the pulp firm and crisp. This fruit is said to taste something like *Jambosa malaccensis;* it is also very attractive in appearance."

For previous introduction, see S. P. I. No. 44891.

49462. GARCINIA LIVINGSTONEI T. Anders. Clusiaceæ.

"(No. 324. Kafue. December 6, 1919.) *Munkononga* (Chimyanja) or *mutunguu* (Mashakalumbwe). A very excellent fruit to eat out of hand. The stone, or rather the embryo, easily dries out. The tree is very productive and has handsome foliage and fruit."

Plate IV shows a fruiting branch of this tree.

49463 and 49464. HOLCUS SORGHUM L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)

49463. "(No. 313. Kafue. December 4, 1919.) An early-maturing kafir."

49464. "(No. 314. Kafue. December 4, 1919.) A later but better type of kafir."

49465. PROTEA ABYSSINICA Willd. Proteaceæ.

"(No. 336. Kafue. December 7, 1919.) A large white Protea which grows on poor soil. The flowers are reddish in color and very attractive, 2 to 3½ inches across. This and other Proteas, while attractive in flower and foliage, hold the old seed heads for several years, and this often gives them a half-dead appearance."

49466. UAPACA SANSIBARICA Pax. Euphorbiaceæ.

"(No. 295. Bolenga Camp. November 25, 1919.) The popular wild fruit *mahobohobo*; also called *masuku* or *massigou*. The tree has broad, leathery evergreen leaves, and the brownish yellow clusters of fruit are produced mainly on the old wood. When very ripe the fruit is sweet, but it is like a persimmon when not fully mature."

For previous introduction, see S. P. I. 32394.

49467. XIMENIA AMERICANA L. Olacaceæ. False sandalwood.

"(No. 309. Kafue. December 4, 1919.) *Impinji*, similar to No. 301 [S. P. I. No. 49602], but a larger fruited form. The fruits are fairly edible if the skin and stone are both rejected; they are borne in abundance and look like *Prunus americana*, but are red and have a large stone. The seed is pounded to obtain the much-prized oil."

For previous introduction, see S. P. I. No. 42896.

49459 to 49471—Continued.

49468. ZEA MAYS L. Poaceæ. **Corn.**

"(No. 312. Kafue. December 4, 1919.) This corn is grown by the natives south of the Kafue River and is said to be a small early-maturing type. It is planted in December, when the rains come."

49469. (Undetermined.)

"(No. 345. Kafue. December 7, 1919.) A small tree, called *m'seche* in Chimyanja, with very attractive white flowers. The fruit, which has the odor of a lychee, is said to be eaten, and the hulls are used in making rattles for dancing."

49470. (Undetermined.)

"(No. 293. Bolenga Camp. November 25, 1919.) *M'fwefee* (Chimyanja). A small tree said to bear very sweet edible fruits, which are small, oval, and green with white spots."

49471. (Undetermined.)

"(No. 337. Kafue. December 7, 1919.) *M'tantanvara* (Chimyanja). A small black fruit resembling a small wild cherry. It is eaten by the natives and dries on the tree much like our *Prunus melanocarpa*."

49472 and 49473.

From Santiago de las Vegas, Cuba. Seeds presented by Dr. Mario Calvino, Agricultural Experiment Station. Received March 5, 1920.

49472. CARICA PAPAYA L. Papayaceæ. **Papaya.**

"Seed of a variety of *Carica papaya* which I received from the cold regions of Colombia; that is, from high altitudes. I think this variety would grow and fruit in California." (*Calvino.*)

49473. CARICA CANDAMARCENSIS Hook. f. Papayaceæ.

A graceful little tree, native to the Andean region of South America, where it is cultivated up to an altitude of 9,000 feet for the sake of its edible fruit. The fruits are smaller and sweeter than those of *C. papaya*, are about 9 inches long, with soft, white flesh, sometimes very acid in cool regions. The outside is of a bright golden yellow. (Adapted from *Curtis's Botanical Magazine, pl. 6198.*)

49474. PITTOSPORUM CRASSIFOLIUM Soland. Pittosporaceæ.

From San Francisco, Calif. Seeds presented by John McLaren, superintendent, Golden Gate Park. Received March 9, 1920.

"An evergreen tree introduced from Australia, its native land. It is of easy culture, not particular as to soil, and is very effective as a lawn ornamental, either single or in groups; it also makes a good hedge plant. It is propagated by seeds." (*McLaren.*)

Mr. McLaren recommends this shrub as one which will probably endure the sea breeze and salt spray of the Florida coast.

49475. PASSIFLORA EDULIS Sims. Passifloraceæ. **Granadilla.**

From Tangier, Morocco. Seeds presented by J. Goffart. Received March 10, 1920.

"The passion vine is extensively grown in Australia and thrives in the warmer portions of the United States, although not yet well known. The fruit is the size and shape of an egg and contains a pulp of exceedingly good flavor; this is eaten with a spoon after cutting off one end of the fruit. The pulp is also

used as a flavoring for cakes, ice cream, and drinks and in fruit salads. The vine grows well in any ordinary open soil with abundant fertilizer. The rich green foliage is very ornamental." (*F. O. Popenoe.*)

For previous introduction, see S. P. I. No. 44854.

49476. Bactris maraja Mart. Phœnicaceæ. **Palm.**

From Bahia, Brazil. Seeds presented by H. M. Curran. Received March 2, 1920.

"(Bahia, December, 1919.) A palm said to grow in a swamp; has a spiny stem and produces clusters of edible dark-purple fruits resembling grapes in appearance and flavor. The fruits are very common in the markets in Illheos, where these were obtained; they are called 'manvel velho,' or swamp coconut." (*Curran.*)

49477 to 49479.

From Kafue, Northern Rhodesia. Collected by Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received March 5, 1920. Quoted notes by Dr. Shantz:

49477. Aulotandra sp. Zinziberaceæ.

"(No. 320. December 4, 1919.) Roots of a beautiful orchidlike plant which forms a spike about 6 inches high, upon which one flower appears at a time. The flowers, about 2 to 3 inches across, have pale-yellow centers with the edges white to lavender or reddish lavender. They open in the morning and last most of the day. The swollen roots have a delicate flavor and are aromatic."

49478. Aulotandra sp. Zinziberaceæ.

"(No. 321. December 4, 1919.) Roots of a delicate Aulotandra with a lacelike pure-white flower with a touch of yellow in the center, which opens in the early evening and fades as soon as the sun strikes it the next day. Only one flower is pushed up at a time. Like the preceding number [No. 49477] but more delicate, and the spike remains under the ground."

49479. Lissochilus arenarius Lindl. Orchidaceæ.

"(No. 322. December 4, 1919.) Tubers of a beautiful land or soil orchid with a spike 1½ to 2½ feet high, bearing beautiful lavender flowers. The flower spike appears in advance of the leaves. This is one of the most attractive orchids I have seen."

49480. Diospyros ebenaster Retz. Diospyraceæ. **Black sapote.**

From Salina Cruz, Oaxaca, Mexico. Seeds presented by Wilbur Barker. Received March 9, 1920.

"The black sapote, which is native to Mexico, is a compact and shapely ornamental tree with oblong-oval glossy leaves about 4 inches long. The fruits, which greatly resemble those of the kaki, or Japanese persimmon, are light green when ripe and from 2 to 4 inches in diameter. The dark-brown or almost black flesh is sweet and when cut up or mashed with orange juice makes a first-rate dish." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 44187.

49481. Prosopis stephaniana (Bieb.) Kunth. Mimosaceæ.

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received March 9, 1920.

"Ayaba, south of Biskra, Algeria." (*Trabut.*)

A shrubby plant, 1 to 2 feet in height, found from the eastern Mediterranean countries to the Caucasus and northern Africa. The branches and petioles are pubescent, and the compound leaves are composed of 4 to 5 pairs of leaflets, with 8 to 12 pairs of pinnæ in each leaflet. The thick pods are ovoid-oblong. (Adapted from *Boissier, Flora Orientalis, vol. 2, p. 633.*)

For previous introduction, see S. P. I. No. 32728.

49482. CUCURBITA PEPO L. Cucurbitaceæ. **Squash.**

From Colon, Canal Zone, Panama. Presented by A. MacIlvane, American consulate. Received March 10, 1920.

"Taboquilla squash seeds." (*MacIlvane.*)

49483. PRUNUS BESSEYI Bailey. Amygdalaceæ. **Sand cherry.**

From Brookings, S. Dak. Seedlings presented by N. E. Hansen, professor of horticulture, South Dakota State College of Agriculture and Mechanic Arts. Received March 12, 1920.

"Sand-cherry seedlings of western South Dakota stock. They have been under cultivation at this station for several plant generations." (*Hansen.*)

49484 to 49488.

From Richmond, Victoria. Seeds presented by F. H. Baker. Received March 13, 1920. Quoted notes by Mr. Baker.

49484. ACACIA CULTRIFORMIS A. Cunn. Mimosaceæ.

"Panton Hill; rare."

A shrubby acacia from Australia with sharp-pointed, simple, whitish leaves and small headlike racemes of yellow flowers. Although it does not exceed 10 feet in height it makes a very elegant ornamental. (Adapted from *Revue Horticole, vol. 68, p. 503.*)

For previous introduction, see S. P. I. No. 48039.

49485. ACACIA PYCNANTHA Benth. Mimosaceæ.

"Panton Hill district."

An Australian shrub with long, narrow, curved leaves and numerous large flower heads, which are borne in terminal panicles. In its native country the bark of this shrub is valued for its large percentage of tannin. (Adapted from *Revue Horticole, vol. 68, p. 504.*)

For previous introduction, see S. P. I. No. 48059.

49486. ACACIA RETINODES Schlecht. Mimosaceæ.

"A very good wattle."

An acacia, native to Australia, with elongated leaves up to 6 inches in length and elegant terminal panicles of odorous flower heads. It is said to flower in France almost throughout the year. (Adapted from *Revue Horticole, vol. 68, p. 505.*)

For previous introduction, see S. P. I. No. 38758.

49487. KENNEDYA RUBICUNDA (Schneev.) Vent. Fabaceæ.
(*Glycine rubicunda* Schneev.)

A shrubby, twining plant, native to New South Wales. It runs up to a height of 5 or 6 feet or more, producing an abundance of large showy dark-red flowers of a somewhat dingy appearance. The plant is easily propagated by seeds, which should be soaked in warm water for a few hours before planting. (Adapted from *Curtis's Botanical Magazine, pl. 268.*)

For previous introduction, see S. P. I. No. 39873.

49484 to 49488—Continued.

49488. TECOMA SMITHII W. Wats. Bignoniaceæ.

"Shrub with yellow blooms; about 5 feet high."

A beautiful shrubby plant, said to have been produced in Australia as a cross between *Tecoma capensis* and *T. mollis*. The flowers have orange tubes and yellow segments and are borne in large compound panicles. (Adapted from *Gardeners' Chronicle, 3d, ser., vol. 14, p. 649.*)

49489 to 49495.

From Arlington, Va. Seedlings grown at the Arlington Experimental Farm, Va., by M. B. Waite and H. W. Truesdell. Numbered March 15, 1920. Quoted notes by Mr. Truesdell.

49489. PYRUS sp. Malaceæ. **Pear.**

"(Row 1, tree 13.) Fruit: Size medium, 2 to 2½ inches in diameter; form regular, globose; stem medium stout, inserted in a pronounced cavity; skin thin, fairly smooth; dots brownish, numerous; color yellow, sometimes with red blush; flesh juicy, firm, fine grained; flavor mild; dessert quality good; ripe September 1 to 15. Earlier, smaller, finer grained, more tender, and slightly better in quality than the Kieffer variety.

"Tree: Large, vigorous, of hybrid-oriental pear character; bark dark gray, branches spreading, foliage dark, abundant, 1½ by 2½ inches (average); very productive; blight resistant.

"When in very rapid growth blight occasionally goes 6 to 12 inches down the shoots. Apparently less susceptible than the Kieffer variety."

49490. PYRUS sp. Malaceæ. **Pear.**

"(Row 2, tree 15.) Fruit: Size medium, 2 to 2½ inches in diameter; form obovoid to slightly pyriform; stem medium length, moderately stout, set in a shallow cavity; skin rather thick, medium smooth, very finely russeted; color greenish brown with a red blush; flesh juicy, firm, fine grained; flavor rich, very sweet; dessert quality best; ripe September 10 to 20.

"Distinctly like the Seckel pear in flavor, texture, and color, but larger and with more red blush and even thicker and more sirupy juice.

"Tree: Medium size and vigor, Seckellike; branches slightly spreading; bark light red; foliage fairly abundant, medium green, 1⅜ by 2¼ inches (average); has not produced heavily; rather blight resistant.

"One blight infection has occurred, girdling the leader in the top of the tree and causing removal about this point. No other blight was seen on this tree, in spite of severe pruning and vigorous twig tips. Probably equal or superior to the Seckel and Kieffer varieties in blight resistance."

49491. PYRUS sp. Malaceæ. **Pear.**

"(Row 22, tree 15.) Fruit: Size medium, 2 by 2¾ inches in diameter; form broadly obovoid; stem short, moderately stout, set in a very slight depression; skin thin; color light yellow; flesh very juicy, fine grained; flavor moderately sweet; dessert quality good; ripe September 10 to 20.

"Tree: Large, vigorous; bark reddish; branches spreading or drooping; foliage abundant, light green, 1⅛ by 1⅞ inches (average); apparently productive; very blight resistant (no blight observed); somewhat susceptible to San Jose scale."

49489 to 49495—Continued.

49492. Pyrus sp. Malaceæ. **Pear.**

"(Row 37, tree 2.) Fruit: Size medium; pyriform, with distinct neck; stem slender, 1½ inches long; skin thin, smooth; color golden yellow; flesh fine grained, juicy, buttery, melting; flavor subacid; dessert quality good to very good; ripe August 25 to September 1.

"Tree: Large, vigorous, of European pear character; bark light gray; branches somewhat spreading; foliage abundant, light green, three-fourths of an inch by 1 inch (average); has not produced heavily; very resistant to blight (no blight observed)."

49493. Pyrus sp. Malaceæ. **Pear.**

"(Row 38, tree 26.) Fruit: Size medium, 2½ by 3 to 3¼ inches; pyriform with a tendency to obconic, neck distinct; stem rather thick, about three-fourths of an inch long; skin thin, smooth, dots numerous, small; color yellow with crimson cheek, sometimes covering entire surface; flesh fine grained, melting; dessert quality good; ripe August 10 to 20.

"Tree: Size moderately large and rather vigorous; bark brown; branches rather spreading; foliage moderately abundant, medium green; has not produced heavily; very resistant to blight (no blight observed)."

49494. Pyrus sp. Malaceæ. **Pear.**

"(Row 1, tree 10.) Fruit: Size medium; 2½ by 2½ inches; form regular, obconic; stem stout, 1 inch long, base fleshy, inserted in a broad shallow cavity; skin rough, rather thick, tender; dots few, large; color yellow; flesh juicy, soft, rather fine grained, melting; flavor rather sweet; dessert quality good; ripe about October 1.

"Tree: Large, vigorous; bark light brown; branches somewhat spreading; foliage abundant, rather dark; productive; blight resistance about the same as the Kieffer variety."

49495. Pyrus sp. Malaceæ. **Pear.**

"(Row 36, tree 4.) Fruit: Size medium, 2 inches in diameter by 2½ inches in length; pyriform; stem medium stout, seven-eighths of an inch long, inserted in a very small cavity; skin thin, tender, smooth, glossy, waxen; dots numerous, inconspicuous; three-fourths of the surface covered with crimson, the rest light yellow; flesh medium juicy, firm, fine grained, mild; dessert quality fair to good; ripe August 10 to 20.

"Tree: Medium size and vigor, of European pear character; bark reddish brown; branches rather upright; foliage not abundant, light green, 1 by 1½ inches (average); has not been productive; blight resistant (observed only on forced top grafts)."

49496. Dioscorea alata L. Dioscoreaceæ. **Greater yam.**

Grown for several years at the Plant-Introduction Field Station, Brooksville, Fla. Numbered March 25, 1920, for convenience in recording distribution.

"A yam obtained from O. P. Wernicke, Brooksville, Fla., who brought it from Avon Park, Fla., where he had grown it in light sandy soil with much success. This yam has a high water content, and when cut into pieces, boiled, and mashed it is easily beaten to a light, creamy consistency without the addition of milk. This is considered to be the best method of preparing this type of yam for the table, and when it is so prepared it is scarcely distinguishable from mashed potato." (*R. A. Young.*)

49497. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

From Kampala, Uganda. Seeds presented by L. Hewett, acting Director of Agriculture, Uganda Protectorate, through Prof. C. V. Piper. Numbered March 20, 1920.

"A red-seeded variety of sorghum grown by the Nubians along the Kongo." (*H. N. Vinall.*)

49498 to 49501. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

From Ibadan, Nigeria. Seeds presented by A. H. Kirby, acting Director of Agriculture, Southern Nigeria, through Prof. C. V. Piper. Numbered March 20, 1920. Quoted notes by H. N. Vinall.

49498. "A variety with flat light-red seed. Native name *Aha Bawa*."

49499. "A variety with white flat seed similar to the variety formerly grown in the United States under the name 'Jerusalem corn.' Native name *Farafara*."

49500. "A pink-seeded variety. Native name *Kawa-prin-sosia*."

49501. "A variety with seed similar to those of *Aha Bawa* [S. P. I. No. 49498], but somewhat smaller and deeper red. Native name not known."

49502 to 49504. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

From Kampala, Uganda. Seeds presented by L. Hewett, acting Director of Agriculture, Uganda Protectorate, through Prof. C. V. Piper. Numbered March 20, 1920. Quoted notes by H. N. Vinall.

49502. "A variety with small dark-red seed, like those of Sumac sorgo. This is probably a sweet-stemmed variety. Native name *Namatera*."

49503. "A variety with small dark-red seed, like *Namatera* [S. P. I. No. 49502]. The seeds appear almost identical. Native name *Kaini*."

49504. "A variety with small dark-red seed, very much like *Namatera* [S. P. I. No. 49502] and *Kaini* [S. P. I. No. 49503], but with a shallow dent in the blossom end of the seed. Native name *Kakoba Kamnubai*."

49505. PHYLLOSTACHYS PUBERULA NIGRA (Lodd.) Houzeau. Poaceæ.
(*P. nigra* Munro.) **Bamboo.**

From Niles, Calif. Plants presented by the California Nursery Co. Received April 17, 1920.

"The black bamboo is one of the important cultivated species in Japan, although it is smaller than the other timber sorts, seldom growing over 20 feet and 1½ inches in diameter.

"The culms when young are covered with dark-brown to purple spots which spread as it grows older until the whole culm becomes dark brown, almost black, except just below the nodes, where there is an ash-gray line. This dark color at once distinguishes the species from all other Japanese bamboos.

"This is one of the hardiest forms grown in England and is certainly one of the most decorative kinds.

"The uses of this species are limited to the manufacture of furniture, numerous household articles, and fancy fishing poles, for all of which these black bamboos are peculiarly fitted." (*David Fairchild.*)

49506 to 49521.

From Poona, Bombay Presidency, India. Seeds presented by Dr. William Burns, economic botanist, Bombay Department of Agriculture. Numbered March 26, 1920.

49506. ANDROPOGON CARICOSUS L. Poaceæ. Grass.

A grass with erect stems, forming tufts at the rooting nodes of the creeping base. The linear leaves are 6 to 8 inches long and the racemes are pale green or silvery. Native to tropical Asia and Madagascar. (Adapted from *Cooke, Flora of Bombay, vol. 2, p. 987.*)

For previous introduction, see S. P. I. No. 41886.

49507. ANDROPOGON CARICOSUS L. Poaceæ. Grass.

Received as *Andropogon annulatus.*

49508. ANDROPOGON PACHYARTHRUS Hack. Poaceæ. Grass.

An annual grass with linear glabrous leaves and slender stems, 6 to 18 inches high, suberect and decumbent below. Native of the East Indies and Dekkan, India. (Adapted from *Cooke, Flora of Bombay, vol. 2, p. 976.*)

Received as *Andropogon pumilus.*

49509. ANDROPOGON PURPUREO-SERICEUS Hochst. Poaceæ. Grass.

A robust annual grass with smooth and polished erect stems 3 to 4 feet high, and linear leaves 8 to 10 inches long. Native to Abyssinia. (Adapted from *Cooke, Flora of Bombay, vol. 2, p. 984.*)

For previous introduction, see S. P. I. No. 41891.

49510. ANDROPOGON PERTUSUS (L.) Willd. Poaceæ. Grass.

A perennial grass native to southern Asia and tropical and subtropical Australia. One of the best grasses to withstand long droughts, while it will bear any amount of feeding. It endures cold better than some other Queensland Andropogons, and though not so palatable to pasture animals as some other grasses it is valuable for the summer season, when many others fail in the arid interior. It is of inferior value where the best English grasses can be grown; it is even apt to strangle them. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 42.*)

For previous introduction, see S. P. I. No. 34046.

49511. ANDROPOGON TRINII Steud. Poaceæ. Grass.
(*A. monticola trinii* Hooker.)

A perennial grass with slender culms, 1 to 3 feet high, in dense tufts and with spreading branches at length erect. Native to India, the East Indies, and tropical Africa. (Adapted from *Thiselton-Dyer, Flora Capensis, vol. 7, p. 349.*)

Received as *Andropogon monticola.*

49512. APLUDA ARISTATA Torner. Poaceæ. Grass.

A creeping perennial grass, commonly found in hedges or other shady places in the plains of northern India and in the Himalayas, ascending to 7,000 feet in altitude. It is used for fodder in the Banda district. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 272.*)

Received as *Andropogon varia.*

For previous introduction, see S. P. I. No. 41892.

49506 to 49521—Continued.

49513. BRACHIARIA EBUCIFORMIS (J. E. Smith) Griseb. Poaceæ. **Grass.**
(*Panicum isachne* Roth.)

A grass from the plains of India and from watery places at altitudes of 6,000 feet in Kashmir and the Punjab to Bengal and southward to Ceylon. The slender much-branched stems are 1 to 2 feet high, with bearded nodes and softly hairy or glabrous leaves. (Adapted from *Hooker, Flora of British India, vol. 7, p. 28.*)

For previous introduction, see S. P. I. No. 32429.

49514. CENCHRUS BIFLORUS Roxb. Poaceæ. **Grass.**

A grass with simple stems, 6 to 24 inches long, and linear-lanceolate leaves 3 to 10 inches long; native to the East Indies. (Adapted from *Cooke, Flora of Bombay, vol. 2, p. 917.*)

For previous introduction, see S. P. I. No. 41894.

49515. CHLORIS PARAGUAIENSIS Steud. Poaceæ. **Grass.**

"A perennial grass native to India, Burma, and Ceylon, but now widespread in the Tropics. According to Duthie it is considered in northern India a good fodder grass up to the time of flowering, after which time cattle will not touch it. In Australia it is considered one of the best grasses fo rpasturage and hay. An earlier test in this country with S. P. I. No. 36255 did not indicate that it is of much value." (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 41897.

49516. COIX LACRYMA-JOBI L. Poaceæ. **Job's-tears.**

This plant, native to southern Asia, New Guinea, and Polynesia, is cultivated for food by the eastern hill tribes of India and supplies a staple article of diet to the Tankhul Nagas of Manipur; it is also grown in Burma. The form cultivated for food has an easily breakable, deeply furrowed shell, that of the wild plant being extremely hard and shining. Seeds require long soaking before they are sown. The plant thrives best under humid conditions. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 135.*)

For previous introduction, see S. P. I. No. 48012.

49517. DINEBRA ARABICA Jacq. Poaceæ. **Grass.**

A laxly cespitose, somewhat rigid annual, branched from the base, with the culms sometimes prostrate, sometimes ascending or obliquely erect, 1 to 18 inches long. Plentiful, but in few localities, on plains flooded in the rainy season between Loanda and Quicuxe, or in damp groves or in drying-up ponds. Native to tropical Africa and the East Indies. (Adapted from *Hiern, Catalogue of Welwitsch's African Plants, vol. 2, pt. 1, p. 223.*)

For previous introduction, see S. P. I. No. 41902.

49518. ISCHAEMUM CILLARE Retz. Poaceæ. **Grass.**

"One form of this grass is harvested in and near Colombo, Island of Ceylon, and is extensively brought into town as fodder for cattle. It is well known as the *Rat-tena*, literally 'red-grass,' of the Singhalese." (*Trimen, Handbook of the Flora of Ceylon, vol. 5, p. 216.*)

A grass with stems 6 inches to 2 feet long, slender or sometimes stout, erect or sometimes creeping, and with leaves 2 to 6 inches long. Native to Bengal, the lower Himalayas, and Ceylon. (Adapted from *Hooker, Flora of British India, vol. 7, p. 133.*)

49506 to 49521—Continued.

49519. ISCHAEMUM SULCATUM Hack. Poaceæ. **Grass.**

A grass, native to India, with slender stems, 8 to 18 inches long, and with leaves 2 to 10 inches long. It is very nutritious and is largely used as fodder wherever it occurs in abundance. It grows along the edges of cultivated land in the black soil of central India, where it is known as *Pownia* or *Pona*. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 7, p. 137.*)

For previous introduction, see S. P. I. No. 41912.

49520. ISEILEMA ANTHEPHOROIDES Hack. Poaceæ. **Grass.**

A stout, tufted grass, less than 3 feet high, with erect or ascending stems, linear leaves, and crowded leafy panicles. Native to the southern Dekkan Peninsula. (Adapted from *Hooker, Flora of British India, vol. 7, p. 219.*)

An annual grass, one of the most valuable forest fodder grasses in the Indian peninsula. (Adapted from the *Agricultural Journal of India, vol. 12, Special Indian Scientific Number, p. 135.*)

For previous introduction, see S. P. I. No. 41913.

49521. PENNISETUM CILIARE (L.) Link. Poaceæ. **Grass.**
(*P. cenchroides* Rich.)

Dhaman. A perennial, spreading, fodder grass, adapted to desert regions, and native to tropical Africa and subtropical southwestern Asia. It is well adapted for silage, green fodder, and hay, and is so nutritious as to have led to the native saying: "What ghi (or ghee, i. e., clarified butter) is to man, that the *dhaman* is to a horse." (Adapted from *Mueller, Select Extra-Tropical Plants, p. 364.*)

For previous introduction, see S. P. I. No. 41915.

49522 to 49524. DIGITARIA EXILIS (Kippist) Stapf. Poaceæ. Fundi.

From Mano, Sierra Leone, West Africa. Seed presented by D. W. Scotland, Director of Agriculture, Njala, Mano, Sierra Leone, through Prof. C. V. Piper. Numbered March 26, 1920.

A cereal native to tropical Africa and cultivated in West Africa, where it was first observed in 1798. It closely resembles *Digitaria longiflora*, which is probably the wild ancestral form. The grain has a very good flavor, and it is believed that if it were exported to Europe it might prove a valuable addition to the light farinaceous articles of food used by the delicate or convalescent. The plant is said not to require manuring and to thrive well in light soils and even in rocky situations. It is grown in Nigeria at an elevation of 4,000 feet. (Adapted from *Kew Bulletin of Miscellaneous Information, No. 8, p. 383. 1915.*)

49522. Light type.

49523. Heavy type.

49524. Medium type.

49525 and 49526.

From Buitenzorg, Java. Tubers presented by the director of the Botanic Gardens. Received February 7, 1920.

49525. COLOCASIA ESCULENTA (L.) Schott. Araceæ. **Taro.**

"*Tallus belang*, or *tallus soerat*. This is a yellow-fleshed taro. The meaning of the vernacular names is said by Dr. P. J. S. Cramer to be 'striped taro.'" (*R. A. Young.*)

49525 and 49526—Continued.

49526. XANTHOSOMA SAGITTAEFOLIUM (L.) Schott. Araceæ. **Yautia.**

"*Kiempoel poetich.* Introduced for testing in the South." (*R. A. Young.*)

49527 to 49567.

From Honolulu, Hawaii. Seeds collected by J. F. Rock and sent through Dr. H. L. Lyon, department of botany and forestry, Hawaiian Sugar-Planters' Association. Received February 19, 1920.

"All of the seeds, except those of No. 963, were collected on Mount Gedeh, Java, in July and August, 1919." (*Lyon.*)

49527. AMOMUM COCCINEUM (Blume) Benth. and Hook. Zinziberaceæ. (*Elettaria coccinea* Blume.)

(No. 929.) A perennial herb, native to the more humid portions of Java, with narrowly acuminate leaves and oblong dense spikes of flowers. (Adapted from *Blume, Enumeratio Plantarum Javae, p. 53.*)

49528. ARECA sp. Phœnicaceæ. **Palm.**

(No. 933.) A palm characterized by its lofty trunk, pinnate leaves, whose stalks are rolled up into cylinders at the bases, and drupelike fruits with fibrous rinds. (Adapted from *Lindley, Treasury of Botany, vol. 1, p. 88.*)

49529. CALOPHYLLUM HASSKARLII Teijsm. and Binn. Clusiaceæ.

(No. 795.) A tree up to 20 meters in height, found throughout the East Indies, but rare in Java. In southern Preanger, Java, the wood is renowned as building material. (Adapted from *Heyne, Nuttige Planten van Nederlandschindië, vol. 3, p. 267.*)

For previous introduction, see S. P. I. No. 11021.

49530. CYRTOSTACHYS LAKKA Beccari. Phœnicaceæ. **Palm.**

(No. 693.) A stately and elegant palm, native to the East Indies, with a slender spineless stem crowned by a cluster of boldly arched leaves 3 to 4 feet in length. The fruits are elongate egg-shaped and about half an inch long. (Adapted from *Beccari, Annales du Jardin Botanique de Buitenzorg, vol. 2, p. 141,* and *Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 947.*)

For previous introduction, see S. P. I. No. 46865.

49531. DIANELLA ENSIFOLIA (L.) Red. Liliaceæ.

(No. 800.) A very attractive member of the lily family from tropical Asia, with long grasslike leaves, lax panicles of blue or white flowers, and globose blue fruits which remain on the plant for some time after maturing. (Adapted from *Curtis's Botanical Magazine, pl. 1404.*)

49532. DRYMOPHLOEUS PROPINQUUS Beccari. Phœnicaceæ.

(No. 752.) A rather small palm, native to New Guinea, with a stem up to 2½ meters in height and 2 centimeters thick. The leaves, about a meter and a half long, are irregularly pinnate with pinnæ about 30 centimeters in length. (Adapted from *Beccari, Malesia, vol. 1, p. 43.*)

49533. FICUS ALBA Reinw. Moraceæ.

(No. 960.) A shrub or small tree from the Malay Archipelago at altitudes under 4,000 feet. Its variously shaped leaves are 5 to 8 inches long, with whitish lower surfaces, and the axillary fruits are about half an inch in diameter. (Adapted from *Hooker, Flora of British India, vol. 5, p. 530.*)

49527 to 49567—Continued.

49534. FICUS sp. Moraceæ.

(No. 962.)

49535. FICUS sp. Moraceæ.

(No. 963.) "From Johore, Federated Malay States." (*Lyon.*)

49536. FICUS sp. Moraceæ.

(No. 964.)

49537. GARCINIA CORNEA L. Clusiaceæ.

(No. 831.) A small erect tree, distributed throughout the Malay Archipelago. It has oblong or oblong-lanceolate leathery, shining leaves, 4 to 6 inches long, and roundish, bright-red fruits the size of a small orange. The seeds are inclosed in a white, juicy, very acid aril. (Adapted from *Hooker, Flora of British India, vol. 1, p. 260.*)

For previous introduction, see S. P. I. No. 39549.

49538. LAGERSTROEMIA SPECIOSA (Muenchh.) Pers. Lythraceæ.
(*L. flos-reginae* Retz.) **Crape myrtle.**

(No. 711.) A tree 50 to 60 feet in height, with leaves 4 to 8 inches long and large panicles of flowers, which vary in color from rose to purple from morning to evening. This is the chief timber tree in Assam, eastern Bengal, and Chittagong, India, where it occurs along river banks and in swampy ground and is commonly cultivated as an avenue tree. It has been introduced into southern California. (Adapted from *Watt, Dictionary of the Commercial Products of India, vol. 4, p. 701,* and *Bailey, Standard Cyclopedia of Horticulture, vol. 3, p. 1775.*)

For previous introduction, see S. P. I. No. 45911.

49539. LICUALA SPINOSA Thunb. Phœnicaceæ. **Palm.**

(No. 848.) A stout palm, 10 to 12 feet high, forming dense tufts, common on wet places throughout the Malay Peninsula. The trunk is about 3 inches thick, and the leaves are 6 or 7 feet long, with spiny petioles and round kidney-shaped blades about 4 feet in diameter. The spadix is longer than the leaves, and the spathes are green sprinkled with brownish scurf. (Adapted from *Calcutta Journal of Natural History, vol. 5, p. 322.*)

49540. LINOSPADIX PETRICKIANA Hort. Phœnicaceæ. **Palm.**

(No. 774.) A very elegant palm, native to New Guinea, of low, graceful, spreading habit. The long pinnate leaves have slender acuminate pinnæ. (Adapted from *Gardeners' Chronicle, third series, vol. 24, p. 298.*)

49541. LIVISTONA sp. Phœnicaceæ. **Palm.**

(No. 815.) The palms of this genus are trees with terminal fan-shaped leaves, with branching flower spikes growing out from among the leaves. They are distributed throughout tropical Asia and Australia. (Adapted from *Lindley, Treasury of Botany, vol. 2, p. 690.*)

49542. MAGNOLIA BLUMEI Prantl. Magnoliaceæ.
(*Manglietia glauca* Blume.)

(No. 695.) A tall glabrous tree with leathery oval or oblong leaves, 5 to 7 inches long, solitary terminal yellowish flowers an inch and a half in length, and ovoid fruits the size of a hen's egg. It is dis-

49527 to 49567—Continued.

tributed throughout Java. (Adapted from *King, Materials for a Flora of the Malayan Peninsula, vol. 1, p. 14.*)

49543. MORINDA BRACTEATA Roxb. Rubiaceæ.

(No. 760.) A medium-sized tree with a slender trunk, native to the eastern portions of the East Indian Archipelago. The most useful part of this tree is the root, which is a source of a red dye for linen and yarns, used by itself or with sapan wood (*Caesalpinia sapan*). The fruits are given to children as a vermifuge. (Adapted from *Heyne, Nuttige Planten van Nederlandschindië, vol. 4, p. 207.*)

49544. MYRICA JAVANICA Blume. Myricaceæ.

(No. 836.) An aromatic shrub, native to Java, with obovate leathery leaves and diœcious catkins. (Adapted from *Blume, Bijdragen Flora Nederlandsch Indië, vol. 1, p. 517.*)

49545. MYRISTICA INERS Blume. Myristicaceæ.

(No. 691.) A tree with slender dark-brown branchlets, oblong-lanceolate papery leaves up to 7 inches long, and large oblong fruits borne singly or in pairs, up to 3 inches long and half as thick. It is native to Java. (Adapted from *Journal and Proceedings, Asiatic Society of Bengal, vol. 75, pt. 2, p. 230.*)

49546. NAGEIA CUPRESSINA (R. Br.) F. Muell. Taxaceæ.
(*Podocarpus cupressina* R. Br.)

(Nos. 797 and 809.) A lofty evergreen tree, distributed throughout the Malay Archipelago. On the older branches the leaves are minute and lanceolate; on the younger branches the leaves are linear, distichous, and spreading. (Adapted from *Hooker, Flora of British India, vol. 5, p. 650.*)

49547. NECTANDRA ANGUSTIFOLIA (Schrad.) Nees and Mart. Lauraceæ.

(No. 835.) A tree native to southern Brazil with narrowly lanceolate acuminate leaves and axillary panicles of flowers. The wood is used for interiors of houses and for cabinetwork. (Adapted from *Correa, Flora do Brazil, p. 46,* and *Linnaea, vol. 8, p. 48.*)

49548. ONCOSPERMA FILAMENTOSUM Blume. Phœnicaceæ. Palm
(*Areca tigillaria* Jack.)

(No. 726.) A very elegant palm with a trunk 30 to 40 feet high, distinctly annulate and armed, and with a thick graceful crown. The pinnate leaves are 10 to 12 feet long with pinnæ about a foot long. On the borders of paddy swamps in the Malay Peninsula this palm is quite common. (Adapted from *Calcutta Journal of Natural History, vol. 5, p. 464.*)

For previous introduction, see S. P. I. No. 45962.

49549. ONCOSPERMA HORRIDUM (Griffith) Scheff. Phœnicaceæ. Palm.
(*Areca horrida* Griffith.)

(No. 707.) A stately palm, 30 to 40 feet tall, indigenous to the Straits Settlements. The trunk is annulate and much armed, and the pinnate dark-green leaves, which spread in every direction, are up to 16 feet in length and 5 feet in width. The axillary spadix has a stout yellow peduncle, and the round, purplish black fruits are the size of a musket ball. (Adapted from *Calcutta Journal of Natural History, vol. 5, p. 465.*)

49527 to 49567—Continued.

49550. OREODOXA sp. Phœnicaceæ. **Palm.**

(No. 771.) Some of the species of this genus are among the most graceful of palms, their slender ringed trunks becoming nearly a hundred feet in height and bearing large terminal pinnate leaves. (Adapted from *Lindley, Treasury of Botany, pt. 2, p. 821.*)

49551. OTOPHORA SPECTABILIS Blume. Sapindaceæ.

(No. 741.) A sapindaceous tree, native to Java, with alternate leaves composed of 7 to 15 pairs of narrowly oblong leaflets, terminal clusters of small flowers, and round berrylike fruits. (Adapted from *Koorders and Valeton, Boomsoorten op Java, Bijdrage No. 9, p. 171.*)

49552. PANDANUS AURANTIACUS Ridley. Pandanaceæ.

(No. 887.) A large branching shrub about 12 feet tall with stems 2 or 3 inches thick, found in swampy places near the sea in the Malay Peninsula. The very narrow leaves are 3 feet long and 1½ inches wide, glaucous green and sharp pointed. The female inflorescence consists of a stout rachis a foot long and five globose orange heads. (Adapted from *Journal of the Royal Asiatic Society, Straits Branch, vol. 41, p. 49.*)

49553. PARANEPHELIUM MACROPHYLLUM King. Sapindaceæ.

(No. 841.) A tree 20 to 40 feet high, native to Perak, Java. The alternate, coriaceous pinnate leaves are 18 to 30 inches long, and the flowers are borne in erect axillary panicles. The surface of the globular woody fruits is covered with thick spines. (Adapted from *Journal of the Asiatic Society of Bengal, vol. 65, p. 450.*)

49554. PINANGA KUHLII Blume. Phœnicaceæ. **Palm.**

(No. 847.) A palm 16 to 25 feet high, native to the lower altitudes of western Java, with a ringed stem 2 inches in diameter. The leaves are terminal, with petioles 2 feet long and elliptical blades about 4 feet long. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 31, p. 97.*)

49555. POLYALTHIA LATERIFLORA (Blume) Kurz. Annonaceæ.

(No. 806.) A tree 50 to 70 feet tall, found at low altitudes in Perak, Java. The leaves are leathery, oblong to elliptic-oblong, with shining upper surfaces and up to 15 inches in length, and the greenish yellow thickish flowers are borne in fascicles. (Adapted from *King, Materials for a Flora of the Malayan Peninsula, vol. 1, p. 307.*)

49556. POLYGONUM sp. Polygonaceæ.

(No. 697.)

49557. RANDIA DUMETORUM (Retz.) Lam. Rubiaceæ.

(No. 833.) A deciduous thorny shrub or small tree, found throughout India and distributed eastward to southern China. The bark and fruit are used medicinally, the former as an external remedy to relieve pains and the latter as an emetic, for which purpose it is considered very valuable. The fresh ripe fruit is also roasted and eaten by the natives in many parts of the country. The light-colored compact wood is used for agricultural implements. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 6, pt. 1, p. 389.*)

49558. RANDIA TOMENTOSA (Blume) Hook. f. Rubiaceæ.

(No. 957.) A large shrub with very stout branches and very stout horizontal spines 1 to 2 inches long. The obovate or roundish leathery leaves are about 2 inches in length, and the velvety flowers are usually

49527 to 49567—Continued.

solitary. This species is distributed from southern India eastward to Java. (Adapted from *Hooker, Flora of British India, vol. 3, p. 110.*)

49559. SABAL MAURITIAEFORMIS (Karst.) Griseb. and Wendl. Phœnicaceæ. **Palm.**

(No. 781.) A West Indian palm with a trunk 60 to 80 feet in height and over a foot in diameter and large roundish leaves multifid to the middle and up to 12 feet in diameter. The black fruits are about the size of peas. (Adapted from *Grisebach, Flora of the British West Indies, p. 514.*)

49560. SALACIA sp. Hippocrateaceæ.

(No. 945.) The species of this genus are smooth erect or trailing evergreen shrubs with opposite shining laurellike leaves and very small green or yellowish flowers. (Adapted from *Lindley, Treasury of Botany, pt. 2, p. 1007.*)

49561. STADMANNIA FRASERI Linden. Sapindaceæ.

(No. 719.) The species of Stadmannia are trees with pinnate leaves having three to five pairs of elongated elliptical smooth leaflets and axillary panicles of small flowers. The wood is hard. (Adapted from *Engler and Prantl, Natürlichen Pflanzenfamilien, vol. 3, pt. 5, p. 334.*)

No published description of this species seems to be available in Washington.

49562. STYRAX sp. Styracaceæ.

(No. 808.) The members of this genus are trees or shrubs native to Asia and North America, with entire leaves and racemes of white flowers. (Adapted from *Lindley, Treasury of Botany, pt. 2, p. 1109.*)

49563. TECTONA GRANDIS L. f. Verbenaceæ. **Teak.**

(No. 832.) The common teak is a native of southern and central India. The young branches are quadrangular, the leaves are opposite and elliptical or egg shaped, and the white flowers are borne in terminal panicles. The wood is highly prized by shipbuilders because of its great strength and durability. (Adapted from *Lindley, Treasury of Botany, pt. 2, p. 1129.*)

For previous introduction, see S. P. I. No. 42374.

49564. TERMINALIA ARBOREA (Teysm.) Koord. and Val. Combretaceæ.

(No. 732.) A tree 30 meters high and 65 centimeters in diameter, distributed throughout Java at altitudes under 1,000 feet. The fruits are used only medicinally; a decoction is said to be a remedy for colic and other digestive disorders. (Adapted from *Heyne, Nuttige Planten Nederlandschindië, vol. 3, p. 355.*)

49565. TERMINALIA ARJUNA (Roxb.) Wight and Arn. Combretaceæ.

(No. 689.) *Arjan.* A very large tree with smooth green or whitish bark, found on river banks throughout central and southern India. The leaves are narrowly oblong, about 9 inches long, and the flowers, which appear in April and May, are borne in terminal panicles. This tree yields a transparent gum which is used as a drug in northern India; the bark is used for tanning, and the wood for carts and agricultural implements. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 6, pt. 4, p. 16,* and *Beddome, Flora Sylvatica of India, vol. 1, pl. 28.*)

For previous introduction, see S. P. I. No. 43668.

49527 to 49567—Continued.

49566. VOACANGA GRANDIFOLIA (Miquel) Rolfe. Apocynaceæ.
(*Pootia grandifolia* Miquel.)

(No. 744.) A shrub or small tree, native to Java, with opposite dark-green elliptic-oblong leaves up to a foot in length. The white flowers are borne in racemelike clusters. (Adapted from *Miquel, Flora van Nederlandsch Indië, vol. 2, p. 417.*)

49567. CALAMUS sp. Phœnicaceæ. **Rattan palm.**

(No. 932.) There are several species of this genus whose stems are known under the names of rattan or canes. These have reedlike stems, rarely more than an inch or two in thickness, and pinnate leaves. The flowers are small, generally pink or greenish, and the fruits are covered with smooth, shining scales. (Adapted from *Lindley, Treasury of Botany, vol. 1, p. 191.*)

49568 to 49581.

From Paris, France. Seeds presented by Prof. E. Schribaux, directeur de la Station d'Essais de Semences. Received March 27, 1920. Quoted notes in italic by Professor Schribaux; other notes by C. W. Warburton.

49568. AVENA STERILIS L. Poaceæ. **Oats.**

"*Avoine du Maroc.* A black oat with long medium-slender lemmas, weak to medium-strong awns, and numerous basal bristles. Probably a winter form and identical with the black kernels in S. P. I. No. 46565."

49569 and 49570. AVENA SATIVA L. Poaceæ. **Oats.**

49569. "*Ligowo* × *Brie.* A segregating hybrid."

49570. "*Ligowo* × *Brie.* A segregating hybrid."

49571 to 49578. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.**
(*T. vulgare* Vill.)

49571. "*Blé de Bordeaux.*"

49572. "*Blé de Gironde.*"

49573. "*Bladette de Puylaurens.*"

49574. "*Rieti* × *Japhet* (No. 30 ou A4)."

49575. "*Rouge de Alsace* × *Bordeaux* (B1)."

49576. "*Rouge de Alsace* × *Bordeaux* (B2)."

49577. "*Rouge de Alsace* × *Bordeaux* (B3)."

49578. "*Rouge de Alsace* × *Bordeaux* (B4)."

49579 and 49580. TRITICUM DURUM Desf. Poaceæ. **Durum wheat.**

49579. "*Blé de Fanfaron.*" **49580.** "*Enano de Jaen.*"

49581. TRITICUM TURGIDUM L. Poaceæ. **Poulard wheat.**

"*Poulard de Australie.*"

49582 to 49612.

From Kafue, Northern Rhodesia. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received March 5, 1920. Quoted notes by Doctor Shantz.

49582. ACACIA sp. Mimosaceæ.

"(No. 346. December 7, 1919.) An acacia with very delicate papery pods; abundant along the upper Kafue River."

49582 to 49612—Continued.

49583. ACACIA sp. Mimosaceæ.

"(No. 349. December 7, 1919.) A large acacia with thick pods; probably the same as No. 276 [S. P. I. No. 49224]; is like *A. robusta*. One of the prominent, larger acacias of this region."

49584. CUCURBITA MAXIMA Duchesne. Cucurbitaceæ. **Pumpkin.**

"(No. 315. December 4, 1919.) A large pumpkin of the ordinary type."

49585. CYMBOPOGON RUFUS (Nees) Rendle. Poaceæ. **Grass.**
(*Andropogon rufus* Kunth.)

"(No. 356. December 7, 1919.) One of the coarser grasses. I question whether this is a good grass for grazing, but it might do for roughage or dry fodder."

49586 and 49587. DIOSPYROS SENEGALENSIS Perr. Diospyraceæ.
Inkulu.

49586. "(No. 296. Bolenga Camp on the Kafue River. November 26, 1919.) A small tree, 10 to 15 feet in height, which is more abundant here than any other type of fruit tree. The fruit, which is called *inkulu*, *inchange*, or *chanja*, is much prized by the natives. It is somewhat smaller than No. 295 [S. P. I. No. 49466] but of equally good flavor; it has one to five seeds (usually three to four in each fruit), is yellow or slightly tan in color, and when not ripe is apparently full of tannin. When the natives wish to eat this or any other fruit they either chop down some of the larger limbs or the whole tree in order to secure the fruit with little or no exertion; they have no respect for trees or any natural growth."

49587. "(No. 297. Bolenga Camp on the Kafue River. November 25, 1919.) A superior tree of No. 296 [S. P. I. No. 49586]. This tree has somewhat longer fruits, which are sweeter and of much better flavor than those from the ordinary trees."

49588. ERYTHRINA sp. Fabaceæ.

"(No. 347. December 7, 1919.) A tree with thick pods which are constricted around each red bean. Used only as an ornament."

49589. GARCINIA LIVINGSTONEI T. Anders. Clusiaceæ.

"(No. 302. November 25, 1919.) More seeds of No. 263a [S. P. I. No. 49169] but collected at Kafue, where it is known as *munkononga* in the Chimyanja tongue."

49590. GOSSYPIUM sp. Malvaceæ.

"(No. 325. December 6, 1919.) A shrub 6 feet high which produces a large number of bolls that contain numerous seeds covered with very short brownish lint."

49591 and 49592. LAGENARIA VULGARIS Schrad. Cucurbitaceæ. **Gourd.**

49591. "(No. 316. December 4, 1919.) A small gourd used green as a vegetable; it is very good. All these fruits are stewed green as a vegetable in this country."

49592. "(No. 334. December 7, 1919.) A gourd used by the natives as soap; also said to be food for cattle and pigs; grows on a vine covering trees that are 20 to 30 feet high."

49582 to 49612—Continued.

49593. LUFFA CYLINDRICA (L.) Roemer. Cucurbitaceæ.
(*L. aegyptiaca* Mill.)

"(No. 303. November 25, 1919.) Seed of the luffa, which grows abundantly here. Same as No. 273a [S. P. I. No. 49163]."

49594. MANIHOT GLAZIOVII Muell. Arg. Euphorbiaceæ. Ceara rubber.

"(No. 351. December 7, 1919.) The Ceara rubber plant was introduced from South America, but is now one of the chief rubber plants of Africa. The trees seem to grow well and are about 15 feet high."

49595. OCHNA POLYNEURA Gilg. Ochnaceæ.

"(No. 326. December 7, 1919.) A small tree, 6 to 15 feet, which has unusually attractive light-green foliage and yellow flowers. The ochnas are among the most attractive trees of this section. For ornamentals they should be valuable wherever they can be grown. They withstand long droughts in this country, but their reaction to cold or frost will have to be determined experimentally."

A fruiting branch of this shrub is shown in Plate V.

49596. OCHNA sp. Ochnaceæ.

"(No. 327. December 7, 1919.) A low bush with red calyces, black carpels, and light glaucous leaves. A most attractive plant, 1 to 1½ feet high, forming a low clump, which when in fruit is a mass of red sepals set off by green and later black carpels. This is by far the most beautiful ochna I have seen, but it forms only a low bush, seldom 2 feet high. The shape is that of a low mound, about three or four times as wide as it is high. The edge is often silvery with the foliage, while the top is red and black from the sepals and carpels."

49597. ODINA EDULIS Sond. Anacardiaceæ.

"(No. 333. December 7, 1919.) A dark-purple grapelike fruit with a delicate skin, somewhat musty in flavor but pleasant after the first taste. It is eaten by the natives and is supposed to be a cure for 'black water fever.' The fruits are produced before the leaves, the latter appearing at about the time the fruits are ripe. The plant is acaulescent, or at least does not develop much above the surface of the soil and thus escapes the annual fires. It is abundant from Pretoria to Kafue."

49598. SESAMUM ORIENTALE L. Pedaliaceæ. Sesame.

"(No. 343. December 7, 1919.) A plant quite abundant on the flats; said by the natives to be an oil plant."

49599. STRYCHNOS sp. Loganiaceæ.

"(No. 310. December 4, 1919.) The small-fruited sweet variety; it is relished by the natives. It is lemon-orange in color, has a thick stony rind, yellowish brown inside, and is rather juicy, with a tart but very agreeable flavor. It is unlike any fruit I have eaten, is much easier to eat than an orange and, I should say, as agreeable to the taste. In eating, the seeds are rejected, as are those of pomegranates. The fruits are borne in great abundance and apparently are possessed of excellent keeping qualities. I think this well worth trying out in cultivation."

For an illustration of fruits of this species, see Plate VI.

49600. STRYCHNOS sp. Loganiaceæ.

"(No. 311. December 4, 1919.) A large fruit, 3 to 5 inches across, very like No. 310 [S. P. I. No. 49599], but not of as good flavor according to the natives. I doubt whether there is much difference."

49582 to 49612—Continued.

49601. VIGNA sp. Fabaceæ.

"(No. 348. December 7, 1919.) This bean looks something like a cowpea, but is apparently a perennial; it was not seen in bloom. It grows 3 to 4 feet high and produces a good crop of beans. Those sent were the first ones to ripen."

49602 to 49604. XIMENIA AMERICANA L. Olacaceæ. False sandalwood.

49602. "(No. 301. November 25, 1919). A tree like No. 279 [S. P. I. No. 49250], but collected at Kafue."

49603. "(No. 304. December 4, 1919.) *Impinji.* Apparently the same as No. 301 [S. P. I. No. 49602] and No. 279 [S. P. I. No. 49250], but with slightly smaller fruits. These are fairly edible if skin and stone are both rejected. They look like *Prunus americana*, but are red in color and have a large stone with a 'paper' shell. The pounded seed is prized for its edible oil. Abundant in Nyasaland."

49604. "(No. 305. December 4, 1919.) Same as No. 301 [S. P. I. No. 49602]."

49605. ZEA MAYS L. Poaceæ. **Corn.**

"(No. 306. December 4, 1919.) Corn, which is said to be small and early, now being planted by the natives on the south side of the Kafue River. The trees are burned down, or chopped and burned afterward, and corn is planted where the soil is richest and where there is least likelihood of trouble from weeds. Termite hills are usually favorite locations."

49606. (Undetermined.)

"(No. 294. Bolenga Camp on the Kafue River. November 25, 1919.) A small tree."

49607. (Undeterimned.)

"(No. 298. Bolenga Camp on the Kafue River. November 25, 1919.) Called *m'tingele* by the Chimyanja. A small tree or shrub with a fruit that appears to be a small kumquat, but which is really fleshy outside. It is eaten by some of the natives. The fruit is very good, although the flesh is very thin."

49608. CANTHIUM LANCIFLORUM Hiern. Rubiaceæ. **Maululu.**

"(No. 317. December 4, 1919.) Called *maululu* in Chimyanja, and 'plum' or 'fruit tree' by the whites. A small tree, 6 to 10 feet high, with a spreading top. The fruits are green, changing to light brown when ripe; they are somewhat spicy and sweetish and very pleasant after the first taste; each fruit has one or possibly two seeds, from 1 to 1¼ inches long. This is regarded by the whites as their best fruit. Green fruits collected one day ripen rapidly and are often good to eat the following day."

Plate VII shows the fruits and Plate VIII the habit of growth of this tree.

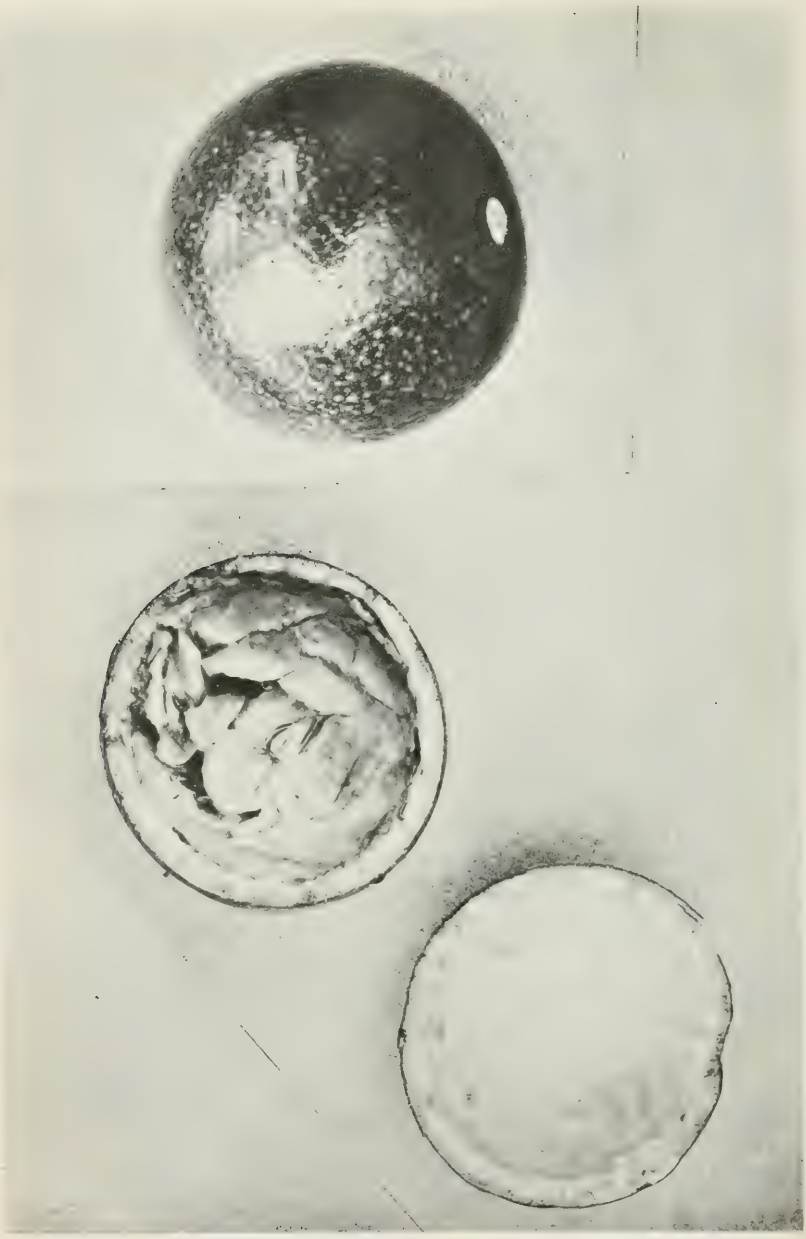
49609. (Undetermined.)

"(No. 319. Kafue. December 4, 1919.) *M'pila* (Chinja). A fruit about 2 inches through, which has a hard rind, green with a purple flush on one side; it is filled with seeds, which are surrounded with more or less fibrous pulp; the juice is milky. In flavor it is almost exactly like Tamarindus. It is used to make a very pleasant drink."



A DROUGHT-RESISTANT ORNAMENTAL FROM NORTHERN RHODESIA. (OCHNA POLYNEURA GILG., S. P. I. No. 49595.)

One of the most attractive of the native ornamentals, this species of Ochna is particularly beautiful both in flower and fruit. The shrub or small tree, 6 to 15 feet, in height, is quite as striking when the light-green foliage is contrasted with its black and yellow fruits as when the leaves form a neutral background for the masses of yellow flowers. (Photographed by Dr. H. L. Shantz, Kafue, Northern Rhodesia, December 3, 1919; P36824FS.)



A NEW RELATIVE OF THE KAFIR ORANGE. (STRYCHNOS SP., S. P. I. No. 49599.)

"This small-fruited species has a deep-yellow fruit, with sweet juicy flesh, slightly acid, but of very pleasing flavor. It is much easier to eat than an orange and fully as agreeable to my taste. The fruits are borne in great abundance and are apparently possessed of excellent keeping qualities."—(*Shantz.*) The true Kafir orange is growing and fruiting in Florida. (Photographed, slightly reduced, by Dr. H. L. Shantz, Kafue, Northern Rhodesia, December 3, 1919; 136852 F.S.)



FRUITS OF THE MAULULU FROM THE ZAMBEZI BASIN. (CANTHIUM LANCIFLORUM HIERN, S. P. I. No. 49608.)

Regarded by the white people of the Zambezi River region as their best fruit, these "plums," as they are often called, merit wide trial. The sweet spicy flavor is very pleasant, and to those who have feasted on them the taste appeals as does that of few other fruits. (Photographed, slightly reduced, by Dr. H. L. Shantz, Kafue, Northern Rhodesia, December 3, 1919; P36826FS.)



A FRUITING TREE OF THE MAULULU. (CANTHIUM LANCIFLORUM HIERN, S. P. I. No. 49608.)

These trees are always small, usually not more than 6 to 10 feet tall, and their delicious fruits are borne profusely. The fruits are green, changing to a light brown when ripe, and are about the size of a large plum. When picked green they ripen rapidly and are often good to eat on the first or second day after being gathered. (Photographed by Dr. H. L. Shantz, Kafue, Northern Rhodesia, December 2, 1919; P36818FS.)

49582 to 49612—Continued.

49610. THUNBERGIA sp. Acanthaceæ.

"(No. 341. Kafue. December 7, 1919.) An attractive plant with a trumpet-shaped flower. This would make a fine garden flower."

49611. TROCHOMERIA GARCINI (L.) Benth. and Hook. Cucurbitaceæ. (*Zehneria garcini* Sond.)

"(No. 350. Kafue, December 7, 1919.)"

An annual vine, native to Africa and India, with cordate, palmately 5-lobed leaves and small greenish flowers followed by 2-seeded fruits the size of a cherry. (Adapted from *Harvey, Flora Capensis, vol. 2, p. 487.*)

49612. PRINTZIA sp. Asteraceæ.

"(No. 355. Kafue. December 7, 1919.) A low perennial resembling Centaurea. May be valuable as a border plant."

49613 to 49661.

From Darjiling, Bengal, India. Seeds presented by G. H. Cave, curator, Lloyd Botanic Garden. Received March 12, 1920.

49613. AIRA sp. Poaceæ. Grass.

Received as *Deyeuxia fiiformis;* identified at the Grass Herbarium.

49614. ALANGIUM ALPINUM (C. B. Clarke) Smith and Cave. Cornaceæ.

A deciduous tree, approaching 39 feet in height, with ascending branches and coriaceous leaves, glabrous above and pilose veined beneath. The lax, axillary, 3-flowered inflorescences with almost glabrous stamens are followed by black fruits, which are at first elongate turbinate, afterwards compressed ellipsoid. Native to the eastern Himalayas at altitudes of 5,000 to 9,000 feet. (Adapted from *Records of the Botanical Survey of India, vol. 6, p. 96.*)

49615. ANEMONE VITIFOLIA Buch.-Ham. Ranunculaceæ.

One of the commonest and most ornamental plants in Nepal, where it grows in all the forests of the great valley and the surrounding mountains, delighting in the most shady, retired, and moist situations in the vicinity of rills and torrents. It is also found in Kumaon and in Gossam Than in the Himalayas. The erect, nearly simple stem, clothed with oppressed hairs, is 1½ to 3 feet high. The cordate radical leaves are long stalked, lobed, and coarsely serrated, much veined and somewhat wrinkled, glabrous above, downy and paler beneath. The involucre consists of two leaves like the radical leaves but smaller in size, inclosing two smaller leaves, from within which arise the three or four peduncles each bearing a single showy flower, drooping in the bud, afterwards erect. The white sepals are obovate and concave. (Adapted from *Curtis's Botanical Magazine, pl. 3376.*)

For previous introduction, see S. P. I. No. 47639.

49616. BERBERIS ANGULOSA Wall. Berberidaceæ. Barberry.

A rare ornamental shrub, 4 feet high and upwards, growing at elevations of 11,000 to 13,000 feet in Nepal, Kumaon, and Sikkim. In autumn it forms a striking object from the rich golden yellow and red coloring of the foliage. The fruit is edible, being less acid than that of the common

49613 to 49661—Continued.

species of Europe and Asia. The erect, puberulent branches are stout, angled, and grooved, with slender, three to five branched spines. The deciduous fascicled leaves, 1 to 1½ inches long are oblanceolate, entire or with a few spinous teeth on the thickened margin, thinly coriaceous, opaque above, shining beneath. The pale golden yellow flowers are pendent on solitary or fascicled peduncles. The scarlet, globosely obovoid berry is nearly an inch long. (Adapted from *Curtis's Botanical Magazine, pl. 7071.*)

For previous introduction, see S. P. I. No. 40143.

49617. BERBERIS CONCINNA Hook. f. Berberidaceæ. Barberry.

A very beautiful and distinct species allied to *Berberis sibirica*, but readily distinguished by the long tripartite spines, slender pedicels, and glaucous leaves. The plant, native to the Sikkim Himalayas at elevations of 12,000 to 13,000 feet, forms a small low bush, 1 to 3 feet high, with spreading, almost prostrate branches thickly covered with small deep-green leaves, polished above, snowy white and glaucous below; these colors, together with the large scarlet berries and red branchlets give the shrub a singularly pretty appearance when in fruit. (Adapted from *Curtis's Botanical Magazine, pl. 4744.*)

For previous introduction, see S. P. I. No. 40145.

49618. BERBERIS HOOKERI Lem. Berberidaceæ. Barberry.
(*B. wallichiana* Hook., not DC.)

An upright-growing ornamental shrub, from 6 to 10 feet high, from near the summit of Mount Sheopur, Nepal. The long branches bear slender, rigid, deeply tripartite spines nearly an inch long. The beautiful spreading fascicled leaves resemble those of Christmas holly. From the center of these fascicles spring the drooping flower clusters. The outer 3 of the 9 to 12 spreading concave yellow sepals are tinged with red. The bright but rather pale yellow petals are concave and smaller than the sepals. (Adapted from *Curtis's Botanical Magazine, pl. 4656.*)

For previous introduction, see S. P. I. No. 44381.

49619. BERBERIS UMBELLATA Wall. Berberidaceæ. Barberry.

A hardy subevergreen ornamental shrub, about 3 feet high, with umbellike racemes of yellow flowers produced abundantly in June. It is readily increased either by seeds or by layering. It is easily known by its narrow, spineless leaves, slightly glaucous beneath when fresh, and becoming more so when dry. Native to the Himalayas. (Adapted from *Edwards's Botanical Register, vol. 30, pl. 44.*)

For previous introduction, see S. P. I. No. 33023.

49620. BETULA UTILIS D. Don. Betulaceæ. Birch.
(*B. bhojpattra* Wall.)

A moderate-sized deciduous tree, native to the temperate Himalayas from Kashmir to Sikkim and Bhutan, 40 to 60 feet high, or a shrub at high altitudes. The smooth, shining, reddish white or white bark peels off in broad horizontal rolls. In these layers the lenticels appear as pink patches. The wood is white with a pinkish tinge, tough, even grained, and moderately hard. A decoction of the bark is used as a wash for poisoned wounds. (Adapted from *Kirtikar, Indian Medicinal Plants, vol. 2, p. 1213.*)

For previous introduction, see S. P. I. No. 47647.

49613 to 49661—Continued.

49621. BROMUS sp. Poaceæ. **Grass.**

Received as *Avena aspera;* identified at the Grass Herbarium.

49622. CALAMAGROSTIS sp. Poaceæ. **Grass.**

Received as *Deyeuxia seratescens;* sample identified at the Grass Herbarium.

49623. CASSIOPE FASTIGIATA (Wall.) D. Don. Ericaceæ.

A beautiful free-flowering alpine shrub, about 9 inches high, one of the choicest from the northwestern Himalayas. These shrubs are fairly abundant at elevations of 12,000 to 13,000 feet in shady situations and in moist, peaty, well-drained soil. The solitary white bell-shaped flowers have the corolla segments recurved, showing the pink center and the curious awned stamens, like those of the arbutus. The tiny leaves, imbricated in four rows which give the stem a four-sided appearance, have white, membranous, ciliated margins. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 47, p. 379.*)

49624. CATHCARTIA VILLOSA Hook. f. Papaveraceæ.

A hardy annual or biennial found in the Sikkim Himalayas. The abundance of long, shaggy, fulvous hairs and the bright-yellow glabrous flowers give it a handsome appearance. The cordate radical leaves are long petioled and palmately five lobed; the stem leaves are sessile, and the uppermost are pinnatifid. The large nodding flowers have golden anthers and a green fleshy stigma. (Adapted from *Curtis's Botanical Magazine, pl. 4596.*)

49625. CAUTLEYA LUTEA Royle. Zinziberaceæ.
(*Roscoea elatior* Smith.)

A plant common in the eastern Himalayas at altitudes of 5,000 to 8,000 feet, where it develops erect tufted stems, 8 to 10 inches long, with pale or reddish brown lower surfaces. The golden yellow flowers are borne in spikes 4 to 8 inches high. (Adapted from *Curtis's Botanical Magazine, pl. 6991.*)

For previous introduction, see S. P. I. No. 47656.

49626. CORYLUS FEROX Wall. Betulaceæ. **Hazel.**

A Chinese tree 20 feet in height, with light, compact, pale wood. The nuts are small and precisely like the common hazelnut in taste. The tawny yellow shell is exceedingly hard and thick. The involucre is made up of beautiful greenish gray laciniate bracts. (Adapted from *Wallich, Plantae Asiaticae Rariores, vol. 1, p. 77.*)

49627. COTONEASTER ACUMINATA Lindl. Malaceæ.

An ornamental shrub native to the Himalayas, with erect branches, ovate-lanceolate leaves 1½ inches long, and white or pinkish flowers, followed by orange-red globosely obovoid fruits. (Adapted from *Revue Horticole, vol. 61, p. 348.*)

For previous introduction, see S. P. I. No. 47663.

49628. CYPERUS sp. Cyperaceæ. **Sedge.**

Received as *Stipa orthoraphium;* identified at the Grass Herbarium.

49613 to 49661—Continued.

49629. DANTHONIA CACHEMYRIANA Jaub. and Spach. Poaceæ. **Grass.**

A perennial grass, with stems 1 to 2 feet high, ascending from a stout woody stock, densely tufted or creeping below and clothed with shining sheaths. The long narrow convolute leaves are erect, wiry, and glabrous; the lower sheaths rarely tomentose. The spikelets are erect, pale, and rather shining. Native to the temperate and alpine Himalayas and western Tibet at elevations of 10,000 to 14,000 feet. (Adapted from *Hooker, Flora of British India, vol. 7, p. 281.*)

49630. DICENTRA SCANDENS (D. Don) Walp. Papaveraceæ.

An herbaceous perennial, native to the temperate Himalayas from Nepal to Garwhal at elevations of 5,000 to 6,000 feet. The angled stem is slender and graceful, and each raceme bears 8 to 12 yellow or purple flowers nearly an inch long, followed by membranous lanceolate capsules. (Adapted from *Hooker, Flora of British India, vol. 1, p. 121.*)

49631. DICENTRA THALICTRIFOLIA (Wall.) Hook. f. and Thoms. Papaveraceæ.

A slender climbing plant with a perennial root, native to the temperate regions of the Himalayas from Nepal to Bhutan and in the Khasi Hills at altitudes of 4,000 to 8,000 feet. Very similar to *Dicentra scandens* except for the thick fleshy ovate-cordate capsule. (Adapted from *Hooker, Flora of British India, vol. 1, p. 121.*)

For previous introduction, see S. P. I. No. 47674.

49632. DOBINEA VULGARIS Buch.-Ham. Anacardiaceæ.

A branching shrub from Nepal, with opposite elliptic, acutely serrate leaves, 4 to 6 inches long. The minute flowers are in lax panicles; the staminate are campanulate and the pistillate apetalous. The narrow capsule has winged margins. (Adapted from *Don, Prodromus Florae Nepalensis, p. 249.*)

49633. ELAEOCARPUS PRUNIFOLIUS Wall. Elæocarpaceæ.

A tree native to Sylhet and the Khasi Hills at altitudes of 1,000 to 3,000 feet. The glabrous lanceolate leaves, 3 to 5 inches long and often recurved, are on 2-inch petioles. The loose racemes of silky flowers, nearly as long as the leaves, are followed by ovoid drupes nearly an inch long. (Adapted from *Hooker, Flora of British India, vol. 1, p. 407.*)

49634. ENKIANTHUS DEFLEXUS (Griffith) C. Schneid. Ericaceæ.
(*E. himalaicus* Hook. f. and Thoms.)

A large ornamental shrub or small tree, 20 feet in hegiht, native to Bhutan and Sikkim at elevations of 8,000 to 10,000 feet, with deciduous leaves crowded toward the ends of the branches and whorls of drooping flowers. The stiff slender branches have red-brown bark, the young ones being bright red, as are also the petioles, midribs, and margins of the leaves. The lanceolate serrulate leaves are 2 to 3 inches long, pubescent beneath when young. The broadly campanulate flowers, half an inch long, with dull yellowish red petals streaked and tipped with brighter red are borne on pendulous hairy pedicels, 1½ inches long. (Adapted from *Curtis's Botanical Magazine, pl. 6460.*)

For previous introduction, see S. P. I. No. 33772.

49613 to 49661—Continued.

49635. FICUS HOOKERI Miquel. Moraceæ.

An entirely glabrous tree, with thinly coriaceous oval leaves up to 11 inches in length and axillary, depressed, obovate fruits growing in pairs, up to an inch in diameter when ripe. This fig is not common; it ascends to 6,000 feet in the Sikkim Himalayas and Khasi Hills, India. (Adapted from *King, Annals of the Royal Botanic Garden, Calcutta, vol. 1, p. 36.*)

For previous introduction, see S. P. I. No. 47685.

49636. GYNOCARDIA ODORATA R. Br. Flacourtiaceæ.

A moderate-sized evergreen tree, with hard round fruits which grow on the stem and main branches, found from Sikkim and the Khasi Hills eastward to Chittagong, Rangoon, and Tenasserim. The fruits are used for fish poison. The seeds were long supposed to be the source of chaulmoogra oil; the true source was discovered in 1899 to be *Hydnocarpus kurzii.* (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 4, p. 192,* and *Watt, Commercial Products of India, pp. 546, 1067.*)

49637. IMPERATA CYLINDRICA (L.) Beauv. Poaceæ. **Blady grass.**
(*I. arundinacea* Cyrilli.)

A well-known agricultural and technical chemist in Queensland has conducted very successful experiments in manufacturing paper pulp out of *lalang grass,* or, as it is more commonly known, *blady grass,* on account of its great blades, which are 4 or 5 feet long. It resembles very closely the esparto of Spain and North Africa, and when dried before making it into pulp yields as high as 60 per cent of first-class paper-making pulp.

This expert states that esparto is the best pulp known and the blady-grass product is within 10 per cent of the same value. There are millions of tons of this grass growing in Queensland. Three crops a year can be cut from it. (Adapted from *Indian Trade Journal, vol. 44, p. 252.*)

For previous introduction, see S. P. I. No. 47700.

49638. IRIS CLARKEI Baker. Iridaceæ. **Iris.**

A handsome iris with a very stout creeping rootstock, a tall stout stem, and linear leaves reaching 2 feet in length. The perianth is bright lilac blotched with violet, with a yellow throat. The bright-violet styles are an inch long with square crests. (Adapted from *Hooker, Flora of British India, vol. 6, p. 275.*)

For previous introduction, see S. P. I. No. 39019.

49639. JASMINUM HUMILE L. Oleaceæ. **Jasmine.**

A profuse-flowered Chinese plant with drooping, somewhat angular branches and pinnate entire leaves, paler beneath. The terminal-panicled yellow flowers are very sweet scented. The tube of the corolla is shorter than the 5 or 6 cleft limb, which is rolled back. The large tongue-shaped anthers lie in the throat of the corolla tube. One plant, only a foot in height, bore 12 panicles. (Adapted from *Curtis's Botanical Magazine, pl. 1731.*)

For previous introduction, see S. P. I. No. 39120.

49613 to 49661—Continued.

49640. Ligustrum confusum Decaisne. Oleaceæ.

A small tree, sometimes attaining a height of 40 feet in Sikkim, India, where it is native. The leathery leaves are up to 3½ inches long, and the white flowers appear in panicles from 1 to 5 inches in length. (Adapted from *Hooker, Flora of British India, vol. 3, p. 616.*)

For previous introduction, see S. P. I. No. 47706.

49641. Lilium giganteum Wall. Liliaceæ. **Lily.**

This majestic lily is common in the damp thick forests of the Himalayas, the Provinces of Kumaon, Gurhwal, and Busehur. The bulb grows close to the surface in rich black mold at altitudes of 7,500 to 9,100 feet, where it is covered with snow November to April. The smooth hollow stems are commonly from 6 to 9 feet high and are used for musical pipes. The handsome cordate leaves, shining dark green above, paler below, are 10 to 12 inches long on petioles of equal length; both become smaller near the apex. In the large, fragrant white flowers, 12 to a raceme, the perianth tube is slightly greenish, and the inner surfaces of the segments are tinged with deep purple. (Adapted from *Curtis's Botanical Magazine, pl. 4673.*)

49642. Michelia excelsa Blume. Magnoliaceæ.

A lofty deciduous tree found in the temperate Himalayas from Nepal to Bhutan, at altitudes of 5,000 to 8,000 feet, and on the Khasi Hills. The tree is known as the white magnolia; the sapwood is small and white and the heartwood olive brown and glossy. The wood is soft but very durable and is used for planking, for door and window frames, and for furniture. It is the principal wood employed for these purposes in the Darjiling Hills. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 5, p. 243.*)

For previous introduction, see S. P. I. No. 47731.

49643. Michelia lanuginosa Wall. Magnoliaceæ.

A Himalayan tree of variable height, with leaves white and fuzzy beneath and white flowers 3 to 4 inches in diameter. In Sikkim it forms a large bush, flowering in autumn. (Adapted from *Hooker, Flora of British India, vol. 1, p. 43.*)

For previous introduction, see S. P. I. No. 47732.

49644. Panax pseudoginseng Wall. Araliaceæ.
(*Aralia pseudoginseng* Benth.)

An herbaceous perennial from Nepal, with 3 to 5 fascicled tubers, which are mucilaginous and slightly aromatic. The purplish stem is erect and simple, and the three or four radical leaves, 2 to 6 inches long, are palmate. The upper leaves are somewhat rough with copious gray, bristly hairs. The leaflets are lanceolate and deeply serrate. The small white flowers are in three umbels, followed by globose scarlet berries. (Adapted from *Wallich, Plantae Asiaticae Rariores, vol. 2, p. 30.*)

For previous introduction, see S. P. I. No. 42622.

49645. Piptanthus nepalensis (Hook.) Sweet. Fabaceæ.

A fairly hardy evergreen climber with beautiful foliage and flowers, which are attractive throughout the summer. It thrives in poor soils if the situation be warm, sunny, and sheltered. In common with most leguminous plants Piptanthus makes simple vertical roots 3 feet in

49613 to 49661—Continued.

length; it then develops stems 3 feet long the first season and reaches a height of 10 feet in the third year. It speedily covers the wall space allotted to it. In the first spring it will make lateral growths, each terminated by a raceme of yellow flowers that in shape closely resembles a bunch of grapes; the individual flowers bear a close resemblance to those of the English gorse (*Ulex europaeus*). The deep green, glabrous, trifoliolate leaves are large and of similar shape to those of well-grown broad beans (*Vicia faba*). (Adapted from *Gardeners' Chronicle, 3d ser., vol. 43, p. 178.*)

49646. Polygala arillata Buch.-Ham. Polygalaceæ.

A large shrub from the mountains of Nepal, with dark-green leaves 5 to 7 inches long and nodding yellow-flowered racemes equaling the leaves in length. The large 3-petaled flowers are irregular; two petals are spreading, and the center one is 3-lobed with the innermost lobe keel shaped. The purple coriaceous capsule is kidney shaped, and the solitary globose seeds are suspended from the center of the capsule in large fleshy, golden yellow arils. (Adapted from *Wallich, Plantae Asiaticae Rariores, vol. 1, p. 84.*)

49647. Prunus cerasoides D. Don. Amygdalaceæ. **Himalayan cherry.** (*P. puddum* Roxb.)

A large tree of brilliant appearance when in flower, from altitudes of 3,000 to 8,000 feet in the temperate Himalayas. The cymes of rose-red or white flowers are followed by oblong drupes with acid yellowish red flesh. (Adapted from *Hooker, Flora of British India, vol. 2, p. 314.*)

For previous introduction, see S. P. I. No. 48276.

49648. Rhododendron anthopogon Don. Ericaceæ. **Rhododendron.**

A small shrub, 1 foot high, with rough, densely scaly branches and leaves which are 1½ inches long, cinnamon brown beneath and, as it were, tomentose from the layer of glands. The yellow flowers are in numerous short terminal fascicles. (Adapted from *Hooker, Flora of British India, vol. 3, p. 472.*)

For previous introduction, see S. P. I. No. 39051.

49649. Rhododendron lepidotum Wall. Ericaceæ. **Rhododendron.**

"This is a very distinct evergreen from the Himalayas and western China. It grows about 1½ feet high, forming compact bushes which bear curious flat purple or reddish blossoms freely during May." (*Gardening Illustrated, vol. 40, p. 303.*)

For previous introduction, see S. P. I. No. 39066.

49650. Rhododendron setosum Don. Ericaceæ. **Rhododendron.**

A neat little shrublet about a foot in height, native of the moorland and rocky slopes of the loftier passes leading across the eastern Himalayas into Tibet, reaching its uppermost limit within a few miles of the summit. Here the brilliant red-purple flowers render this species a charming object, and after hot sunshine the air is filled with a heavy aroma due to a copious resinous secretion which testifies to the comparatively dry climate it enjoys. It is a typical high alpine species with its late flowering and early fruiting, its dwarf habit, and slow growth. The twigs are beset with deciduous spreading hairs. The tiny coriace-

49613 to 49661—Continued.

ous leaves are sparingly scaly on both surfaces. (Adapted from *Curtis's Botanical Magazine, pl. 8523.*)

For previous introduction, see S. P. I. No. 39067.

49651. RIBES GRIFFITHII Hook. f. and Thoms. Grossulariaceæ.

A glabrous plant from the temperate and subalpine east Himalayas, in Bhutan and Sikkim at 10,000 to 13,000 feet. The broad cordate leaves, 3 to 7 lobed, are very smooth and pointed. The lax pendent racemes, 9 inches long, bear large flowers, followed by very beautiful red berries, which are extremely sour. (Adapted from the *Journal of the Linnean Society, vol. 1, p. 88.*)

For previous introdution, see S. P. I. No. 44904.

49652. RUBIA CORDIFOLIA L. Rubiaceæ. **Madder.**

An herbaceous creeper with rough or hispid leaves, five to a whorl, common throughout the hilly districts of India from the northwest Himalayas eastward and southward to Ceylon. The manjit root obtained from this plant was formerly much employed by the natives of India in dyeing coarse cotton cloth various shades of scarlet, coffee-brown, or mauve. It has been largely displaced by the tar dyes, but is still employed for special purposes or in remote localities. The method of dyeing practiced is much the same all over India, the color being produced by steeping the fabric in an infusion of the stem or root chips, subsequent to being mordanted with a solution of alum. (Adapted from *Watt, Commercial Products of India, p. 927.*)

For previous introduction, see S. P. I. No. 48277.

49653. RUBUS MOLUCCANUS L. Rosaceæ.

A robust prickly plant from elevations of 3,000 to 7,000 feet in the central and eastern Himalayas. The inflorescences and wide-spreading branches are densely clothed with white, gray, or fulvous tomentum, and the leaves, 2 to 10 inches across, are tomentose beneath. The white flowers are followed by globose juicy fruits of many small scarlet drupes. (Adapted from *Hooker, Flora of British India, vol. 2, p. 330.*)

For previous introduction, see S. P. I. No. 47782.

49654. RUBUS sp. Rosaceæ.

Received as *Rubus niveus*. The seeds do not agree with our samples of *R. niveus* Thunb. nor with *R. niveus* Wall.=*R. pedunculosus* Don.

49655. SLOANEA DASYCARPA (Benth.) Hemsl. Elæocarpaceæ.

A Chinese tree about 15 feet high, with rigidly erect flowering branches. The lanceolate leaves are coriaceous, the nodding flowers are axillary or in terminal corymbs; the sepals are broad, and the cup-shaped corolla is toothed and scarcely longer than the very numerous stamens. The prickly capsule dehisces into five valves, each valve bearing a fleshy, golden aril containing four or five seeds. (Adapted from *Hooker, Icones Plantarum, pl. 2628.*)

49656. SOLANUM MACRODON Wall. Solanaceæ.

An erect, shrubby plant, clothed with minute, glistening, jointed hairs, growing at altitudes of 3,000 to 8,000 feet in the temperate Himalayas from Nepal to Bhutan and in the Khasi Hills. The lanceolate leaves,

49613 to 49661—Continued.

2 to 6 inches long, are setulose above. The purple-rose or nearly white flowers are followed by small globose berries. (Adapted from *Hooker, Flora of British India, vol. 4, p. 232.*)

For previous introduction, see S. P. I. No. 47799.

49657. SORBUS MICROPHYLLA Wenzig. Malaceæ.
(*Pyrus microphylla* Wall.)

An ornamental shrub native to the Himalayas, with erect, spreading branches and gray-black bark. The compound unequally pinnate leaves are green above, paler below. The small flowers are in corymbs and are followed by small ruby-colored pomes. (Adapted from *Garcke, Linnaea, vol. 38, p. 76.*)

For previous introduction, see S. P. I. No. 39135.

49658. SPIRAEA BELLA Sims. Rosaceæ. **Spirea.**

A beautiful hardy shrub, native to Nepal, continuing in flower from May until the end of the summer. It may be increased by layers or seeds and flourishes in fresh loamy soil. The lanceolate blue-green leaves are alternate and the full terminal clusters of rose-colored flowers make this a striking ornamental. (Adapted from *Loddiges, Botanical Cabinet, vol. 13, pl. 1268.*)

For previous introduction, see S. P. I. No. 47801.

49659. SPIRAEA MICRANTHA Hook. f. Rosaceæ. **Spirea.**

A shrub, native to Sikkim, India, and Bhutan, at altitudes of 5,800 to 10,000 feet. The membranous or coriaceous ovate-lanceolate leaves, 7 inches long, are glaucous hairy beneath. The very broad open cymes have small pale-colored flowers with spreading hairs. (Adapted from *Hooker, Flora of British India, vol. 2, p. 325.*)

For previous introduction, see S. P. I. No. 47802.

49660. STYRAX HOOKERI C. B. Clarke. Styracaceæ. **Styrax.**

A tree, often 40 feet high, from altitudes of 6,000 to 7,000 feet in Sikkim and Bhutan. The inch-long flowers are tomentose outside, and the young branches are stellately pubescent. The wood is white, close grained, and moderately hard. (Adapted from *Hooker, Flora of British India, vol. 6, pt. 8, p. 385.*)

49661. SWERTIA HOOKERI C. B. Clarke. Gentianaceæ.

A perennial herb with tufted, long-petioled, elliptic, radical leaves, 4 inches long, and smaller sessile stem leaves. The nodding purplish blue-veined flowers with oblong blue anthers are in axillary cymes. The annual flowering stems, 1½ to 4 feet high, are erect, thick, and hollow. (Adapted from *Hooker, Flora of British India, vol. 4, p. 127.*)

For previous introduction, see S. P. I. No. 41591.

49662 to 49686.

From Paris, France. Presented by Vilmorin-Andrieux & Co. Received March 16, 1920.

49662. BERBERIS BRACHYPODA Maxim. Berberidaceæ. **Barberry.**

(Seeds of Wilson No. 4416.) A bushy barberry 4 to 7 feet in height, found at altitudes of 5,200 to 11,700 feet in western China. It has 3-parted spines, oval serrate leaves, long slender panicles of yellow flowers, and

49662 to 49686—Continued.

scarlet fruits up to half an inch in diameter. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 375*, and *Schneider, Illustriertes Handbuch der Laubholzkunde, vol. 2, p. 922.*)

For previous introduction, see S. P. I. No. 43818.

49663. BUDDLEIA DAVIDII Franch. Loganiaceæ.
(*B. variabilis* Hemsl.)

(Seeds.) A tall shrub, native to the mountainous portions of northern China, with opposite dark-green leaves from 4 inches to a foot in length, oblong or narrowly lanceolate, and either coarsely serrate or entire. The clear lilac flowers are crowded in dense heads 4 to 6 inches long. (Adapted from *Curtis's Botanical Magazine, pl. 7609.*)

For previous introduction, see S. P. I. No. 44531.

49664. CHAENOMELES LAGENARIA WILSONII Rehd. Malaceæ.

(Seeds of Wilson No. 4120.) A bush 4 to 6 meters tall, found at an altitude of 1,800 meters in western Szechwan. The flowers vary in color from white to red, and the fruits are golden and red. This variety differs from the typical form in the dense yellowish wool which covers the lower surfaces of the leaves. (Adapted from *Sargent, Plantae Wilsonianae vol. 2, p. 298.*)

For previous introduction, see S. P. I. No. 34589.

49665. CORNUS PAUCINERVIS Hance. Cornaceæ.

(Seeds of Wilson No. 136.) A low, spreading shrub, native to eastern Szechwan, China, where it frequents river banks and similar situations. The deep-green lanceolate leaves are nearly 2 inches long, and the white, showy flower clusters are produced abundantly in July from the ends of the branches and branchlets. About the 1st of October appear the jet-black fruits, which are quite showy. (Adapted from the *Gardening Magazine, vol. 24, p. 200.*)

49666. COTONEASTER SALICIFOLIA FLOCCOSA Rehd. and Wils. Malaceæ.

(Plants of Wilson No. 1133*a*.) A graceful shrub 2 to 4 meters high, native to western Szechwan, China, at altitudes of 2,300 to 3,000 meters. The coriaceous, usually oblong-lanceolate light-green leaves are up to 2 inches in length; the white flowers are borne in dense corymbs, and the roundish fruits are light red. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 173.*)

For previous introduction, see S. P. I. No. 44422.

49667. CRATAEGUS CULLASAGENSIS Ashe. Malaceæ.

(Cuttings.) A small tree up to 25 feet in height, native to Macon County, N. C., where it frequents dry woods and slopes. It has rough dark bark, dropping branches, obovate or elliptic serrate leaves, and roundish fruits about half an inch long, which become orange-red at maturity. (Adapted from *Small, Flora of the Southeastern United States, p. 555.*)

49668. DAVIDIA INVOLUCRATA Baill. Cornaceæ.

(Plants.) A shrub or low tree, indigenous to western China, with alternate, oval, acuminate leaves and terminal flower heads. Each flower head is preceded by two large creamy white bracts of unequal size, the larger reaching a length of about 7 inches. (Adapted from *Gardeners' Chronicle, 3d. ser., vol. 33, p. 786.*)

49662 to 49686—Continued.

49669. DAVIDIA INVOLUCRATA VILMORINIANA (Dode) Hemsl. Cornaceæ.

(Seeds.) A tree 40 to 50 feet tall, native to western China, with alternate, ovate, coarsely serrate, bright-green leaves 2 to 4 inches long, inconspicuous flowers in terminal globular heads, and greenish yellow fruits with brown dots, nearly 2 inches long. The bracts are like those in the typical form. (Adapted from *Curtis's Botanical Magazine, pl. 8432.*)

For previous introduction, see S. P. I. No. 44127.

49670. DEUTZIA VILMORINAE Lemoine and Bois. Hydrangeaceæ.

(Plants of M. Vilmorin No. 1547.) A vigorous erect shrub, native to China, suggesting in general appearance some of the smaller kinds of Philadelphus. Late in the spring it bears clusters of pure-white flowers with yellow anthers. Because of its late flowering it usually escapes the injurious effects of late frosts. (Adapted from *Gardening Illustrated, July 7, 1917.*)

For previous introduction, see S. P. I. No. 35184.

49671. DEUTZIA sp. Hydrangeaceæ.

(Plants of M. Vilmorin No. 4277.)

49672. HEMIPTELEA DAVIDII (Hance) Planch. Ulmaceæ.
(*Zelkova davidii* Hemsl.)

(Cuttings.) A stout-branched shrub, native to Mongolia, with smooth brown bark and long stout spines on the smaller branches. The caducous leaves are small, oval, and deeply dentate, and the very inconspicuous flowers appear in April. (Adapted from *Revue Horticole, vol. 85, p. 30.*)

49673. HYPERICUM PATULUM HENRYI Veitch. Hypericaceæ.

(Plants of Wilson No. 1355.) This variety of *Hypericum patulum*, first discovered by Dr. A. Henry in Yunnan, China, is hardier than the typical form and sturdier in habit. The ovate dark-green leaves are 2 to 3 inches long, and the flowers are of a rich glowing yellow and about 2 inches wide. (Adapted from *Gardeners' Chronicle, third series, vol. 38, p. 179.*)

For previous introduction, see S. P. I. No. 43849.

49674. JASMINUM NUDIFLORUM Lindl. Oleaceæ. **Jasmine.**

"A yellow-flowered jasmine, growing on dry banks, ravines, etc., in Shansi, China, where it flowers before the leaves come out, sometimes even in midwinter. The plants are of spreading habit, with very long, slender, green branches which root wherever they touch moist ground, making them very desirable for covering old walls, banks, etc." (*Frank N. Meyer.*)

For previous introduction, see S. P. I. No. 38248.

49675 to 49677. LIGUSTRUM DELAVAYANUM Hariot. Oleaceæ. **Privet.**

This hardy shrub was first discovered by Abbé Delavay in the mountains of Yunnan, China, where it became 2 to 4 meters high. In habit it is prostrate-spreading except for a few perfectly upright branches which rise from the center of the shrub. The shining dark-green foliage, which is remarkably persistent, reminds one of a myrtle and with the white flowers and blue-black fruits makes this plant a very attractive ornamental. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 601,* and *Revue Horticole, vol. 73, p. 495.*)

49662 to 49686—Continued.

49675. (Seeds of Wilson No. 1075.)

49676. (Seeds of Wilson No. 1076*a*.)

49677. (Seeds of Wilson No. 1290.)

49678. POPULUS YUNNANENSIS Dode. Salicaceæ. **Poplar.**

(Cuttings.) A poplar from the Province of Yunnan, China, with oval or narrowly oval, lightly dentate acuminate leaves with whitish lower surfaces. (Adapted from *Dode, Extraits d'Une Monographie Inédite du Genre Populus, p. 63.*)

49679. PYRACANTHA CRENULATA (Don) Roemer. Malaceæ.
(*Crataegus crenulata* Roxb.)

(Plants.) "A rather small hawthorn, closely allied to *Crataegus pyracantha*, with small glistening green foliage and bearing a multitude of bright-red berries, found in stony places in Kansu, China, at altitudes of 3,000 to 5,000 feet. It would be very attractive as an ornamental rockery shrub." (*Frank N. Meyer.*)

For previous introduction, see S. P. I. No. 40737.

49680. × RHODODENDRON SMITHII Sweet. Ericaceæ. **Rhododendron.**

(Plants.) "A hybrid of *Rhododendron arboreum* and *R. ponticum* with rose-purple flowers." (*Rehder.*)

49681. RHODODENDRON sp. Ericaceæ. **Rhododendron.**

(Plants of M. Vilmorin No. 5303.)

49682. RIBES DIACANTHA Pall. Grossulariaceæ. **Currant.**

(Plants.) A deciduous shrub, 4 to 6 feet high, native to Siberia and northern China. The obovate or rounded leaves are coarsely toothed and often 3-lobed and are up to 2 inches in width. The male flowers are yellow and are borne in erect racemes, and the smooth scarlet fruits are about the size of a red currant. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 401.*)

For previous introduction, see S. P. I. No. 40431.

49683. ROSA LONGICUSPIS Bertol. Rosaceæ. **Rose.**
(*R. sinowilsoni* Hemsl.)

(Plants of Wilson No. 1334.) A rambling bush about 20 feet high, native to western China, with sparse short prickles, large dark-green leaves, and very large lax corymbs of white flowers, the latter up to 2 inches in width. (Adapted from *Kew, Bulletin of Miscellaneous Information, 1906, p. 158.*)

49684. ROSA SOULIEANA Crép. Rosaceæ. **Rose.**

(Seeds.) A large straggling bushy rose, native to Szechwan, China, with short, very sharp prickles and pale-green leaves 2 to 3 inches long. The creamy white flowers are about 2 inches wide and are borne singly at the ends of the branches or in cymose clusters. The small globular fruits are orange. (Adapted from *Willmott, The Genus Rosa, pt. 4, pl. 18.*)

For previous introduction see S. P. I. No. 38159.

49685. SPIRAEA JAPONICA ACUMINATA Franch. Rosaceæ. **Spirea.**

(Plants of Wilson No. 579.) A handsome, hardy, deciduous shrub, 3 to 6 feet in height, native to western Szechwan and Hupeh, China, at altitudes of 1,000 to 1,700 meters. In July and August appear the

49662 to 49686—Continued.

brilliant rose-colored or red flowers which make a very fine contrast with the dark-green foliage. (Adapetd from *Paxton, The Flower Garden, vol. 11, p. 113,* and *Sargent, Plantae Wilsonianae, vol. 1, p. 452.*)

49686. STYRAX JAPONICUM Sieb. and Zucc. Styracaceæ.
(*S. serrulatum* Hook. f., not Roxb.)

(Plants.) A bush or small tree, common in southern Japan, where it is much cultivated on account of its ornamental appearance. The leaves, very variable in size and form, are usually elliptic or narrower, and the white flowers, borne in drooping cymes, are about three-fourths of an inch in diameter. (Adapted from *Curtis's Botanical Magazine, pl. 5950.*)

49687 to 49708.

From Belgian Kongo. Seeds and bulbs collected by Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received March 22, 1920. Quoted notes by Doctor Shantz.

49687. BRACHIARIA BRIZANTHA (Hochst.) Stapf. Poaceæ. **Grass.**
(*Panicum brizanthum* Hochst.)

"(No. 424. Bukama. January 15, 1920.) A tall grass, especially in the higher land. Very abundant on the uplands, forming a large part of the great grass cover of this grassland country, with scattered trees and bushes."

49688. CAESALPINIA PULCHERRIMA (L.) Swartz. Cæsalpiniaceæ.

"(No. 437. Bukama. January 16, 1920.) One of the most ornamental shrubs of this section. The flowers are red with 10 long stamens. It is extensively planted on the streets of Kongola."

For previous introduction, see S. P. I. No. 7266.

49689. CHLORIS PARAGUAIENSIS Steud. Poaceæ. **Grass.**

"(No. 422. Bukama. January 15. 1920.) A semiruderal which with *Dactyloctenium aegyptium* constitutes the chief weed cover at Bukama. It is very prolific and ripens its seeds early. It occurs even in the native sod."

For previous introduction, see S. P. I. No. 45208.

49690. DACTYLOCTENIUM AEGYPTIUM (L.) Richter. Poaceæ. **Grass.**
(*Eleusine aegyptiaca* Desf.)

"(No. 423. Bukama. January 15, 1920.) A ruderal varying greatly in size; it forms a dense early growth following rains. It often looks like Buchloë when reduced to one spikelet by overcrowding."

For previous introduction, see S. P. I. No. 38017.

49691. DALECHAMPIA sp. Euphorbiaceæ.

"(No. 417. Bukama. January 16, 1920.) A very attractive slender vine with white bracts below the flowers. It looks somewhat like a Euphorbia."

49692. DIGITARIA UNIGLUMIS (A. Rich.) Stapf. Poaceæ. **Grass.**

"(No. 438. Bukama. January 15, 1920.) An important river-bottom grass with slender branched panicles."

49687 to 49708—Continued.

49693. ECHINOCHLOA PYRAMIDALIS (Lam.) Hitchc. and Chase. Poaceæ. (*Panicum pyramidale* Lam.) **Grass.**

"(No. 425. Bukama. January 15, 1920.) A tall grass of the lower lands."

49694. ERAGROSTIS CILIANENSIS (All.) Link. Poaceæ. **Grass.**

"(No. 426. Bukama. January 15, 1920. Herb. No. 469.) A low grass; it may be the same as that collected at Elizabethville."

49695. GLADIOLUS PSITTACINUS Hook. Iridaceæ. **Gladiolus.**

"(No. 418. Bukama. January 16, 1920. Herb. No. 560.) A beautiful pure-yellow gladiolus which grows in very wet soil, but also occurs on the upland. An important introduction, probably the same as No. 432, which is a fine large pure-yellow flower, as fine as our cultivated types. Very pure, but ranging to almost mottled with reddish spots in some individuals. The flower has unusually good form."

For previous introduction, see S. P. I. No. 14003.

49696. HIBISCUS sp. Malvaceæ.

"(No. 416. Bukama. January 16, 1920. Herb. No. 576.) A low plant, about a foot high, with pretty pink flowers."

49697. HOLCUS SORGHUM EFFUSUS (Hack.) Hitchc. Poaceæ.

"(No. 420. Bukama. January 15, 1920.) A grass, apparently wild, all about Bukama; it grows either singly or in clumps from 5 to 12 feet high. When in flower the panicle is yellowish or with a reddish tinge, but dark or almost black when ripe. The leaves of the nearly ripe plant are red spotted. It is apparently regarded only as a weed here, but it is a very abundant grass along the river bottom. For the most part the plants are 7 to 12 feet high with very long heads. All down the Lualaba River to Kindu it is quite abundant, often growing almost as a swamp plant, but usually along the sides of paths or roads as a semiruderal. No use is made of it by the natives, and I have not seen it grazed."

49698. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc. Poaceæ.

"(No. 421. Bukama. January 15, 1920.) A mixed lot of seed from many plants of the above [S. P. I. No. 49697]."

For previous introduction, see S. P. I. No. 45209.

49699. INDIGOFERA sp. Fabaceæ.

"(No. 434. Bukama. January 16, 1920. Herb. No. 572.) A plant resembling Astragalus, but with leaves like a rose."

49700. MELOTHRIA sp. Cucurbitaceæ.

"(No. 436. Bukama. January 16, 1920.) A very small fruited cucurbit; fruit one-fourth of an inch in diameter."

49701. OXALIS sp. Oxalidaceæ.

"(No. 433. Bukama. January 16, 1920. Herb. No. 553.) Bulbs of a very odd oxalis collected between Kalule Sud and Bukama. It is attractive chiefly on account of the leaf, which is cut back at the apex to form two lobes very much like leaflets. It has a storage root below the bulb as large in diameter as the bulb itself."

49687 to 49708—Continued.

49702. PENNISETUM GLAUCUM (L.) R. Br. Poaceæ. Pearl millet.
(*P. typhoideum* Rich.)

"(No. 427. Bukama. January 15, 1920.) This plant, apparently a ruderal, grows almost everywhere and in almost the same locations as corn. Seed is exported at times to Rhodesia."

For previous introduction, see S. P. I. No. 48095.

49703. RICINUS COMMUNIS L. Euphorbiaceæ. Castor-bean.

"(No. 419. Bukama. January 16, 1920.) Castor-oil bean."

For previous introduction, see S. P. I. No. 47913.

49704. VIGNA sp. Fabaceæ.

"(No. 429. Bukama. January 16, 1920. Herb. No. 578.) A large vine very abundant here, with some variation in leaf. The following numbers may not be distinct, but have been kept separate and are each from the type shown in herbarium specimens."

49705. VIGNA sp. Fabaceæ.

"(Nos. 430 and 431. Bukama. January 16, 1920. Herb. No. 581.) Similar to the foregoing [S. P I. No. 49704]."

49706. VIGNA sp. Fabaceæ.

"(No. 428. Bukama. January 16, 1920. Herb. No. 578.) Similar to the foregoing [S. P. I. Nos. 49704 and 49705]."

49707. ZEA MAYS L. Poaceæ. Corn.

"(No. 415. Kalule Sud. January 10, 1920.) Corn grown by the natives at this place; apparently the small variety seen growing in the small fields here. Corn is now growing in the fields here, nearly ripe and in all stages to that just emerging from the soil. That is always true of native culture whenever moisture conditions are such as to permit it."

49708. (Undetermined.)

"(No. 435. Bukama. January 16, 1920.) A small legume, about a foot high, with opposite long-lanceolate leaves and two beans in a pod."

49709 and 49710.

From Para, Brazil. Seeds presented by Paul Le Cointe, Goeldi Museum. Received March 31, 1920.

49709. MIMUSOPS HUBERI Ducke. Sapotaceæ.

"*Massaranduba* with large yellow fruits; from the vicinity of Para." (*Le Cointe.*)

A large tree found in the primeval forests of Para, Brazil; it has very thick, rough bark and obovate leaves about 6 inches long. The 1 or 2 seeded roundish fruits are pale yellow with occasional reddish violet markings. They are edible and are sold in the markets of Para. The timber is used for general construction work and for railroad ties. (Adapted from *Archivos do Jardim Botanico do Rio de Janeiro, vol. 2, p. 14.*)

49710. THEOBROMA GRANDIFLORA (Willd.) Schum. Sterculiaceæ.

"*Cupú-assú* from the vicinity of Para." (*Le Cointe.*)

The cupú-assú is one of the most important fruit trees of the State of Para, where it commonly grows in slightly shaded places in the lower Amazon basin. The elliptical fruits, which are borne on the trunk and

49709 and 49710—Continued.

branches like the cacao, are the largest of the genus, being as large as coconuts, and the hard shell incloses a fibrous acid pulp from which a delightful drink is prepared. (Adapted from *Kew, Bulletin of Miscellaneous Information, 1910, No. 5, p. 164.*)

For previous introduction, see S. P. I. No. 33260.

49711 to 49713.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received March 9, 1920.

49711. BOTOR TETRAGONOLOBA (L.) Kuntze. Fabaceæ. Goa bean. (*Psophocarpus tetragonolobus* DC.)

A tropical or subtropical blue-flowered herbaceous perennial which forms a dense cover and holds its leaves all summer. Underground tubers are formed, which are eaten raw or cooked; the young pods make a delicious vegetable when cooked as green beans are cooked; the shelled seeds are eaten even after the pods become too tough for food; and the young inflorescences are often used for salads. An analysis of the dried tubers showed the following percentages of constituents: Water, 9.05; fat, 0.98; protein, 24.62; carbohydrates, 56.07; cellulose, 5.38; ash, 3.90. (Adapted from *Bornay, Les Plantes Tropicales de la Famille des Légumineuses, p. 183.*)

For previous introduction, see S. P. I. No. 47510.

49712. CITRUS WEBBERII Wester. Rutaceæ.

"*Mangapug.* I commend these seeds from Cotabato to your special attention as one of our best native citrus fruits and difficult to obtain." (*Wester.*)

For previous introduction, see S. P. I. No. 47919.

49713. DILLENIA INDICA L. Dilleniaceæ.

"*Hondapara.* A fruit tree introduced from India. This tree should prove successful in Porto Rico and possibly in southern Florida." (*Wester.*)

A handsome medium-sized tree with a round compact crown; the dark-green leaves, 30 to 43 centimeters long and 9 centimeters in width, are coarsely serrate, with prominent veins. The large white flowers are fragrant and attractive; the smooth, greenish, heart-shaped fruits, 80 millimeters long by 95 millimeters across, are produced in great profusion, maturing in September and October. The edible part consists of the large fleshy sepals which inclose the carpels and are pleasantly acid, suggesting the flavor of an unripe apple. In India the sepals are used in making jelly and cooling drinks and also as a vegetable in curries. (Adapted from the *Philippine Agricultural Review, vol. 10 p. 16.*)

For previous introduction, see S. P. I. No. 6887.

49714 to 49716.

From Kalule Sud, Belgian Kongo. Collected by Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received March 12, 1920. Quoted notes by Doctor Shantz.

49714 to 49716—Continued.

49714. ANANAS SATIVUS Schult. f. Bromeliaceæ. **Pineapple.**

"(No. 414. Kalule Sud. January 10, 1920.) Slips of a pineapple from the side of the track. May be from Natal; may be grown in the Kongo."

49715. GLADIOLUS sp. Iridaceæ.

"(No. 411. Kalule Sud. January 10, 1920.) Bulbs of a tall yellowish gladiolus with small red spots, abundant especially along the track. Compares favorably with the cultivated forms in size."

49716. (Undetermined.) Orchidaceæ.

"(No. 412. Kalule Sud. January 10, 1920.) A plant of a small orchid common on the trees about here. Not in flower at this time."

49717 to 49719.

From Grinnell, Iowa. Seed presented by Henry A. Conard, Grinnell College. Received March 19, 1920. Quoted notes by Mr. Conard.

49717. CAPSICUM ANNUUM L. Solanaceæ. **Red pepper.**

"Seeds from three plants raised in Grinnell, Iowa, in 1919, from seed sent from Changsha, Hunan, China, to Ko-Nien Yang, a young Chinese student in the botany department. The fruits are 5 to 6 inches long, about 1 inch through at the stem end, tapering to a point; deep red, thin fleshed, and very pungent in flavor; very prolific. Subject to a fungous disease causing concentric circles of black pustules."

49718 and 49719. CUCURBITA PEPO L. Cucurbitaceæ. **Pumpkin.**

49718. "Seed from a large pumpkin grown in the botanical garden of Grinnell College, Grinnell, Iowa, in 1919, from seed sent from Changsha, Hunan, China, to Ko-Nien Yang. The fruits, cut in December, reached 18 inches across and 12 inches high; they are shallowly furrowed and of a dull-orange color with many green spots; the flesh is deep orange, 2 to 3 inches thick, soft and easily cooked, and of mild flavor. The skin is thin and soft but immune to rots, the fruits keeping perfectly into March."

49719. "From medium-sized fruit, picked before full maturity, cut in March."

49720. CASUARINA CUNNINGHAMIANA Miquel. Casuarinaceæ.

From San Gabriel, Calif. Seed presented by William Hertrich, San Marino Ranch. Received March 20, 1920.

A tree, 60 to 70 feet high, native to New South Wales and Queensland, with hard, close-grained, prettily marked timber, which is used for shingles and staves. The wood burns well and the ashes retain heat for a long time. (Adapted from *Maiden, Useful Native Plants of Australia, p. 397.*)

49721 and 49722.

From Scheemda, Netherlands. Seed presented by N. V. Homo Ten Have, seedsman. Received March 20, 1920.

49721. BRASSICA ALBA (L.) Boiss. Brassicaceæ. **White mustard.**

An annual white mustard from eastern Europe, northern Africa, and northern and middle Asia. The seeds are less pungent than those of the black mustard (*Brassica nigra*) but are used in a similar manner. The young leaves of both are useful as a potherb and also as a salad. The cold-pressed oil of mustard seed serves for table use.

49721 and 49722—Continued.

From 15 to 20 pounds of seed of the white mustard are required to sow an acre, which in the climate of California yields in a few months a harvest of 1,400 pounds of seed. The plant matures its seeds well, even in the desert tracts of central Australia. It can be grown in shallow soil, even on land recently reclaimed from swamps, but it prefers clayey ground. The stalks and foliage after the seed harvest serve as sheep fodder. The plant can be employed with great advantage as green manure. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 82.*)

For previous introduction, see S. P. I. No. 45000.

49722. BRASSICA JUNCEA (L.) Cass. Brassicaceæ. **Mustard.**

A mustard native from middle Africa to China. It is cultivated all over India for Sarepta mustard seed; also extensively raised in China as a pickle. It is a good salad plant. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 82.*)

For previous introduction, see S. P. I. No. 32416.

49723 to 49729. CITRUS spp. Rutaceæ.

From Seharunpur, United Provinces, India. Budwood presented by A. C. Hartless, superintendent, Government Botanic Gardens. Received March 22, 1920. Quoted notes by Mr. Hartless.

49723 and 49724. CITRUS GRANDIS (L.) Osbeck. **Pummelo.**

49723. "Red pomelo."

49724. "Large white-fleshed pomelo."

49725. CITRUS sp.

"Nagpur orange."

49726. CITRUS sp.

"Round seedless lemon."

49727. CITRUS sp.

"Kaghzi lime."

49728. CITRUS sp.

"At Auni Kala lime."

49729. CITRUS sp.

"Sylhet or Rangpur lime."

49730. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

From the city of Guatemala. Budwood collected by Wilson Popenoe, Agricultural Explorer for the Bureau of Plant Industry. Received March 22, 1920.

"Budwood of various ages from avocado No. 41, Finca El Pintado." (*Popenoe.*)

49731. LILIUM NEPALENSE D. Don. Liliaceæ. **Lily.**

From Ness, Neston, England. Seeds presented by A. K. Bulley. Received March 24, 1920.

A showy lily, native to the central Himalayas, with a slender erect stem, 2 to 3 feet long, leafy to the inflorescence. The glossy bright-green leaves, 4 to 6 inches in length, are oblong-lanceolate and 5 ribbed. The flowers, 4 to 5 inches long, are greenish yellow outside and yellow within and flushed except in the

upper third with purplish black; the oblanceolate segments are reflexed only in the upper half. The purplish black filaments bear yellow anthers nearly an inch long. The plant was first discovered in the high mountains of Nepal. (Adapted from *Curtis's Botanical Magazine, pl. 7043.*)

For previous introduction, see S. P. I. No. 46086.

49732. GLADIOLUS sp. Iridaceæ.

From Kabalo, Belgian Kongo. Bulbs collected by Dr. H. L. Shantz, Agricultural Explorer for the Bureau of Plant Industry. Received March 26, 1920.

49733 to 49736.

From Foochow, Fukien, China. Seeds collected by J. B. Norton, Agricultural Explorer for the Bureau of Plant Industry. Received March 29, 1920. Quoted notes by Mr. Norton.

49733. MELOTHRIA HETEROPHYLLA (Lour.) Cogn. Cucurbitaceæ.

"(Herb. No. 1551. Kuliang Hills, near Foochow. July, 1919.) A wild vine with beautiful red fruits about the size of plums. This should be valuable as a cover for trellises."

49734. RUBUS PAYKOUANGENSIS Lev. Rosaceæ. **Raspberry.**

"(Herb. No. 1264. Kuliang Hills, near Foochow. July, 1919.) A low simple-leaved raspberry common in deep ravines. The fruit is edible but not plentiful."

49735. RUBUS SWINHOII Hance. Rosaceæ. **Raspberry.**

"(Herb. No. 1262. Kuliang Hills, near Foochow. July 3, 1919.) A black-purple raspberry, rather dry and bitter, but a very vigorous type. Suitable for crossing with those lacking in flavor."

49736. STYRAX SERRULATUM Roxb. Styracaceæ. **Styrax.**

"(Herb. No. 1560. Kuliang Hills, near Foochow. July, 1919.) A small shrub bearing an abundance of fruit."

49737 to 49742.

From Antigua, Guatemala. Cuttings collected by Wilson Popenoe, Agricultural Explorer for the Bureau of Plant Industry. Received March 17, 1920. Quoted notes by Mr. Popenoe.

49737. BEGONIA sp. Begoniaceæ. **Begonia.**

"(No. 290. February 16, 1920.) A species which is found in moist places on the upper slopes of the Volcan de Agua at altitudes of approximately 7,000 to 9,000 feet. It often reaches 6 feet in height, and its flesh-pink flowers are of large size."

49738. CRATAEGUS STIPULOSA (H. B. K.) Steud. Malaceæ. **Manzanilla.**

"(No. 289. February 16, 1920. Herb. No. 949.) *Manzanilla.* A wild tree growing on the Volcan de Agua at about 8,000 feet altitude. See S. P. I. No. 45575 for description."

49739 and 49740. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

49739. "(No. 291. February 16, 1920.) Avocado No. 38 from the Finca La Chacara in Guatemala. Guatemalan race. The parent tree is about 35 feet high, of erect habit, branched 12 feet from the ground, with an oval open crown. The bearing habits of the tree

49737 to 49742—Continued.

appear to be good; the crop this season is about 400 fruits, well distributed through the crown. The fruits are borne singly, never in clusters.

"The fruits on the parent tree are variable in size. The largest weigh about 24 ounces, the smallest not over 8 ounces. The shape is fairly uniform. The relative size of the seed varies somewhat, as is usual in avocado varieties. The major-domo of the finca recommends this as a very good fruit. Technically it may be described as follows:

"From broadly ovoid to nearly oval, sometimes tending to become broadly pyriform; weight 20 ounces, more or less; length 4½ inches; greatest breadth 4 inches; base rounded, the stem inserted almost squarely; apex flattened or slightly depressed; surface smooth, dull green with numerous greenish yellow and russet dots; skin about one-twentieth of an inch thick, woody and brittle in texture, readily separating from the flesh; flesh cream yellow, pale green close to the skin, with slight fiber markings, smooth in texture and of rich nutty flavor; quality very good; seeds oblate, weighing about 2 ounces; tight in the cavity with both seed coats adhering closely. Ripening season probably midseason to late, March to June at Antigua."

49740. "(No. 293. February 16, 1920.) Avocado No. 40 from the Finca La Chacara in Antigua. Guatemalan race. The parent tree is about 25 feet high, spreading in habit, with a dense crown (most of the foliage is on the outside). The crop this year is not heavy, but the bearing habits of the tree are said to be good. The major-domo recommends this as the finest avocado in the finca, and to me it looks unusually promising because of the large size of the fruit coupled with the small size of the seed and the excellent quality of the flesh.

"Following is a description of the fruit: Form oval to elliptic, sometimes oblique; weight 16 to 24 ounces; length 4½ to 5½ inches; greatest breadth 3¾ to 4 inches; base broadly pointed, the stem inserted slightly to one side; apex broadly pointed, somewhat flattened on the ventral side; surface undulating to faintly pebbled, moss green with numerous yellowish green dots; skin 1½ to 2 millimeters thick (about one-fifteenth of an inch), woody, brittle; flesh cream yellow, pale green close to the skin, free from all fiber discoloration, and of rich, pleasant flavor; quality excellent; seed relatively very small, tight in the cavity, with both seed coats adhering closely to the cotyledons. Season apparently rather late."

49741. Rubus sp. Rosaceæ. **Raspberry.**

"(No. 287. February 16, 1920.) A wild raspberry from the upper slopes of the Volcan de Agua (collected at about 9,000 feet), near Antigua. The plants, which are found in grassy places on rich volcanic loam, send up stems 4 to 6 feet long, which often bend over and root at the tips. The flowers are white, and the fruits, which I have seen only in an immature state, are produced in abundance. Evidently they are as large as the raspberries of the north, and the Indians say they are of good quality."

49737 to 49742—Continued.

49742. SALVIA LINDENII Benth. Menthaceæ. **Sage.**

"(No. 288. February 16, 1920.) A red-flowered shrub which grows abundantly on the upper slopes (at altitudes of 8,000 to 9,000 feet) of the Volcan de Agua, near Antigua. It is erect, slender, and 8 to 10 feet in height. The flowers are double the size of those of *Salvia splendens* and of a rich rose-crimson. The species, which is evidently a perennial, should be hardy enough to stand the winters of California and Florida."

49743. TRIGONELLA FOENUM-GRAECUM L. Fabaceæ. Fenugreek.

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. Received March 9, 1920.

"This plant yields an important condiment, and its root system is so well provided with tubercles that it is worthy of serious attention as a green-manure crop. The seeds are also of value for feeding purposes, and a large quantity of fodder is produced, which, if cut before the seeds ripen, is of excellent quality. The condition powders and condiment foods which are sold in England extensively and fed to ailing horses and cattle are mixtures of fenugreek with other meals or grains. Fenugreek is sometimes planted with berseem." (*David Fairchild.*)

49744. THEOBROMA CACAO L. Sterculiaceæ. Cacao.

From Coban, Guatemala. Seeds presented by Dr. Oscar Majus. Received March 23, 1920.

A wide-branching evergreen tree, native to Central America and South America. The brown or purple beanlike seeds furnish the chocolate and cocoa of commerce. Apparently there are numerous distinct varieties, but little has been done thus far in the selection of the best types for commercial plantings.

49745 to 49796.

From the city of Guatemala, Guatemala. Collected by Wilson Popenoe, Agricultural Explorer for the Bureau of Plant Industry. Received March 23, 1920. Quoted notes by Mr. Popenoe.

49745. ACACIA FARNESIANA (L.) Willd. Mimosaceæ. **Cassie.**

"(No. 327*a*. El Barranquillo. February 26, 1920.) *Subin.* Seeds of a tree about 20 feet high, which in Guatemala produces an abundance of small yellow flowers in January."

For previous introduction, see S. P. I. No. 45012.

49746. PITHECOLOBIUM TORTUM Mart. Mimosaceæ.

"(No. 322*a*. El Barranquillo. February 26, 1920. Herb. No. 953.) *Aripin.* Seeds of the medium-sized tree which produces an abundance of small yellow flowers in February."

49747 and 49748. ANANAS SATIVUS Schult. f. Bromeliaceæ. **Pineapple.**

49747. "(No. 318. Guatemala. February 26, 1920.) Plants of *Piña de Palin*, from San Lorenzo del Cubo, about 5,300 feet altitude. This pineapple is not of excellent quality, but, like *Red Spanish*, which it resembles in other respects as well, it is a good shipper.

"The plant is distinguished by its broad, coarsely serrate leaves. The fruit is oblong to oval-oblong, commonly about 6 inches long, with a large crown and broad recurving leaves. The surface is

49745 to 49796—Continued.

deep brownish yellow, and the carpels are marked by deeply incised lines. The eyes stand out prominently, making the surface of the fruit decidedly rough. The flesh is crisp, deep yellow, with plenty of acid and aroma, and enough sugar so that it can be eaten, when fully ripe, without additional sweetening. The juice is very abundant. This variety seems to do better than others at high altitudes, i. e., in a cool climate."

49748. "(No. 319. Guatemala. February 26, 1920.) Plants of *Piña de azucar*, from San Lorenzo del Cubo, about 5,300 feet altitude. This variety, which is usually seen only on the coast or at altitudes of 3,000 feet and lower, strongly resembles *Smooth Cayenne*, and is probably a Guatemalan form of the latter."

49749. ARGEMONE MEXICANA L. Papaveraceæ.

"(No. 325*a*. El Barranquillo. February 26, 1920.) *Carlos Santo.* Seeds of an herbaceous plant about 4 feet high, which produces in March bright-yellow poppylike flowers about 2 inches broad."

49750. BIXA ORELLANA L. Bixaceæ. **Annato tree.**

"(No. 329*a*. El Barranquillo. February 26, 1920. Herb. No. 967.) *Achiotillo.* Seeds of a large shrub or small tree which produces rather large white flowers in January."

For previous introduction, see S. P. I. No. 44954.

49751. BRACHYPODIUM MEXICANUM (Roem. and Schult.) Link. Poaceæ. **Grass.**

"(No. 297*a*. Antigua. February 17, 1920.) Seeds of a common grass from the upper slopes of the Volcan de Agua at altitudes of 7,000 to 8,000 feet. Its ultimate height is about 3 feet, and its leaves are rather succulent and narrow."

49752. CASSIA sp. Cæsalpiniaceæ.

"(No. 343*a*. El Barranquillo. February 26, 1920.) *Verbenilla.* Seeds of a tree 20 feet high, which produces yellow flowers in December."

49753. CEANOTHUS COERULEUS Lag. Rhamnaceæ.

"(No. 296*a*. Antigua. February 17, 1920.) *Ka-kiish.* Seeds of a large shrub, very similar to the common mountain lilac of southern California. It is abundant on the upper slopes of the Volcan de Agua at altitudes of 6,000 to 8,000 feet, and the dried branches are much used by the Indians of Santa Maria de Jesus as a support for chayote plants, peas, etc. The Indian name, *ka-kiish* (Cakchikel language), probably has reference to this use, as *kiish* is the name of the chayote. The plant may reach 10 or 12 feet in height; it produces panicles up to 4 inches long of fragrant lilac-blue flowers."

49754. COMBRETUM FARINOSUM H. B. K. Combretaceæ.

"(No. 341*a*. El Barranquillo. February 26, 1920. Herb. No. 958.) Flor de peineta. Seeds of a climbing plant which bears red flowers in March. The flowers are arranged in long, stiff racemes, which gives the common name *peineta*, or 'comb flower.'"

49745 to 49796—Continued.

49755. CROTALARIA LONGIROSTRATA Arn. Fabaceæ.

"(No. 298*a*. Antigua. February 17, 1920. Herb. No. 950.) *Much.* Seeds of a fine-leaved bushy perennial Crotolaria from Santa Maria de Jesus, where it is cultivated in the gardens of the Indians. It is also grown elsewhere in Guatemala. The tender shoots are esteemed as greens and are cooked with meat or added to soups. The plant grows about 5 feet high and has woody branches. *Much* (pronounced 'mooch') is the name used by the Cakchikel Indians."

49756. CROTALARIA MAYPURENSIS H. B. K. Fabaceæ.

"(No. 300*a*. Antigua. February 17, 1920. Herb. No. 944.) Seeds of a shrubby Crotalaria about 5 feet high, with large yellow flowers like those of *Crotalaria retusa*. It occurs as a wild plant near Antigua."

49757. DAHLIA MAXONII Safford. Asteraceæ. **Dahlia.**

"(No. 308*a*. Antigua. February 20, 1920.) Seeds of a dahlia which the Kekchi Indians of northern Guatemala know as *tzolokh*, while those who speak the Pokonchi language call it *shikor*. Spanish-speaking Guatemalans usually term it *Santa Catarina*. Though extremely abundant, both wild and cultivated, in many parts of the Guatemalan highlands (principally between 3,000 and 7,000 feet altitude) it seems never to have received much attention from botanists; indeed, as Dr. W. E. Safford found in 1919 that it had not yet received a name, he described it as *Dahlia maxonii* in honor of William R. Maxon, of the United States National Herbarium.

"Sometimes the stems reach to 15 or 18 feet and become quite woody toward the base. They terminate in a number of slender branches, each bearing several flowers, not all of which open at the same time. The flowers face outward and upward, as opposed to those of *D. imperialis*, which are distinctly nodding. The color is lilac-pink and the diameter of the flowers commonly 3 to 5 inches.

"When brought into cultivation around the huts of the Indians the species seems to lose its stability. In place of single lilac-pink flowers other forms often appear, and since the plant is easily propagated by cuttings it is a simple matter to reproduce these variations. A single white form is occasionally seen, and a double white and a double lilac are more common.

"When planted in northern gardens this species would be cut down by frost before it had time to reach the flowering stage, though it has in a few instances bloomed in California. (I am assuming that the species I have seen is *D. maxonii*.) In Florida, if the proper soil conditions can be provided, it should prove successful; and there are many places in northern India, in southern Japan, in subtropical Brazil, and numerous other countries where it would find congenial surroundings."

49758. DAHLIA POPENOVII Safford. Asteraceæ. **Dahlia.**

"(No. 303. Antigua, February 17, 1920.) Tubers collected near Santa Maria de Jesus at an altitude of 6,500 feet.

"This species, which grows in the mountains of central Guatemala at altitudes of 5,000 to 7,000 feet, has been considered by Doctor Safford to be one of the wild parents of the cultivated cactus dahlias. It is a plant rarely exceeding 4 feet in height, with slender stems surmounted by single flowers 2 to 3 inches in diameter, having eight ray florets of

49745 to 49796—Continued.

crimson or orange-crimson. It is interesting chiefly to those engaged in breeding dahlias."

49759. ERYTHRINA RUBRINERVIA H. B. K. Fabaceæ.

"(No. 338*a*. El Barranquillo. February 26, 1920.) *Pito*. Seeds of one of the native Erythrinas. While not so valuable perhaps as a flowering plant as some of its congeners, it has the interesting feature of edible flower buds, and it is a vegetable of some importance among the Guatemalans. The buds are boiled with meat."

49760. GUAIACUM GUATEMALENSE Planch. Zygophyllaceæ.

"(No. 336*a*. El Barranquillo. February 26, 1920. Herb. No. 952.) *Guayacán*. Seeds of the Guatemalan lignum-vitæ, a small tree which is covered in February or March with lavender-blue flowers."

For previous introduction, see S. P. I. No. 47900.

49761. MEDICAGO SATIVA L. Fabaceæ. **Alfalfa.**

"(No. 307*a*. Antigua. February 20, 1920.) Presented by Don Pedro G. Cofiño, of Antigua. Seeds of a variety of alfalfa which has been grown in Antigua for many years, perhaps introduced in Colonial days. Don Pedro Cofiño has planted *Grimm* and other varieties of alfalfa obtained from the United States, and none of them has given such good results as this native (or acclimatized) stock. He thinks, therefore, that the latter may prove useful in other regions with climatic conditions similar to those of Antigua.

"Alfalfa is grown in Antigua without irrigation, and flourishes even during the driest part of the year. There is no rainfall from October to May, and the total annual precipitation is from 30 to 40 inches. The permanent water table, however, is only 6 to 15 feet below the surface of the soil throughout the valley of Antigua. Alfalfa is cut in the Antigua region every 40 days throughout the year."

49762. MELIA AZEDARACH L. Meliaceæ.

"(No 332*a*. El Barranquillo. February 26, 1920. Herb. No. 968.) *Paraiso*. Seeds of a tree 25 feet high with small whitish flowers, produced in January."

For previous introduction, see S. P. I. No. 26500.

49763. PENNISETUM COMPLANATUM (Nees) Hemsl. Poaceæ. **Grass.**

"(No. 305*a*. Antigua. February 17, 1920.) *Kos-kún*. Seeds of the most important forage grass of the Antigua region. It is especially esteemed by the Indians of San Antonio Aguas Calientes. It makes slender wiry stems up to 6 feet high, with narrow succulent leaves and a foxtail seed head 5 or 6 inches long. It seems to grow well on dry land, though it is much less succulent during the dry season than during the wet."

49764 to 49776. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

49764. "(No. 313*a*. Guatemala. February 26, 1920.) Seeds of stock plant No. 5 from the Finca La Chacara in Antigua. An apparently very productive tree with nearly spherical fruits averaging a little less than a pound in weight and having an unusually small seed."

49745 to 49796—Continued.

49765. "(No. 314*a*. Guatemala. February 26, 1920.) Seeds of stock plant No. 4 from the Finca Chacara in Antigua. Bud wood of this variety was introduced under avocado No. 38 (S. P. I. No. 49739), which see for description."

49766. "(No. 315*a*. Guatemala. February 26, 1920.) Seeds of stock plant No. 3 from the Finca La Polvora in Antigua. The parent tree is about 30 feet high, broad and spreading. It produced this season about 700 fruits. The fruit is broad pyriform to nearly round; weight of the largest specimens 16 to 18 ounces; length 4¼ to 4½ inches; greatest breadth 3½ to 4 inches; base pointed to nearly round, the stem inserted obliquely without depression; apex slightly flattened; surface decidedly rough, deep purplish maroon, almost glossy; dots not conspicuous; skin 1 to 2 millimeters (one twenty-fifth to one-twelfth of an inch) thick, somewhat more flexible than in the average variety of this region; flesh cream-yellow to yellow near the seed, whitish green close to the skin, almost free from fiber discolorations; dry in texture and of rich, pleasant flavor; quality good; seed round to oblate, 3 ounces in weight, tight in the seed cavity with both seed coats closely surrounding the cotyledons. Ripens in midseason."

49767. "(No. 317*a*. Guatemala. February 26, 1920.) Seeds of stock plant No. 2 from the Finca La Polvora in Antigua. The parent tree is about 35 feet high, erect, almost slender. It produced about 800 fruits this year, which ripened early to midseason. The fruit is oblong-ovoid to obovoid; weight of the largest specimens 12 to 14 ounces; length 4¼ to 4½ inches; greatest breadth 3¼ to 3½ inches; base slightly flattened to tapering, with the stem inserted to one side or nearly squarely; apex rounded to flattened slightly on one side; surface distinctly pebbled, moss green, with a few large greenish yellow dots; skin 1½ to 2½ millimeters (one-eighteenth to one-tenth of an inch) thick, hard and brittle; flesh cream yellow, very pale green close to the skin, the fiber markings noticeable, flavor strong, the texture a trifle watery; quality fair; seed nearly spherical in outline, 2 ounces in weight, tight in the cavity, with both seed coats adhering closely to the cotyledons."

49768. "Seeds for stock from fruits purchased in the market in Guatemala."

49769. "Seeds for stock from fruits purchased in the market at Guatemala."

49770. "(No. 312*a*. Guatemala. February 26, 1920.) Seeds of stock plant No. 6 from the garden of an old Indian in San Antonio Aguas Calientes. The parent tree is about 20 feet high, evidently not very old, and is bearing this season a heavy crop, more than 500 fruits. The fruit is broadly ovoid to nearly round, obliquely flattened at the apex; weight about 10 ounces; length 3½ inches, greatest breadth 3¾ inches; surface pebbled faintly, deep green with numerous yellow-green dots; skin 1 millimeter (one twenty-fifth of an inch) thick near the stem, becoming 2 millimeters (one-twelfth of an inch) at the apex; flesh cream-yellow, green near the skin, with slight fiber discolorations; flavor rich and oily; seed very large, roundish oblate, tight in the cavity, with both seed coats adhering closely to the cotyledons."

49745 to 49796—Continued.

49771. "(No. 316*a*. Guatemala. February 26, 1920.) Seeds of stock plant No. 1 from the Finca La Polvora in Antigua. The tree from which the seeds were gathered is very prolific, having produced 450 fruits this season. The fruit ripens early at Antigua."

49772 to 49776. "Seeds for stock; from fruits purchased in the market at Guatemala."

49777. TRIPLARIS AMERICANA L. Polygonaceæ.

"(No. 335*a*. El Barranquillo. February 26, 1920.) *Bailador.* Seeds of a tree said to be 25 feet high, with small white flowers, produced in January."

49778. PETREA sp. Verbenaceæ.

"(No. 326*a*. El Barranquillo. February 26, 1920.) *Palo de amor.* Seeds of a shrub 5 feet high, which produces small purplish flowers in May."

49779. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

"(No. 334*a*. El Barranquillo. February 26, 1920.) *Jurún.*"

49780. SALVIA AMARISSIMA Ortega. Menthaceæ. **Sage.**

"(No. 304*a*. Antigua. February 17, 1920. Herb. No. 951.) Seeds of an herbaceous plant about 2 feet high, with terminal spikes of small tubular flowers of the richest blue. It is found along roadsides in this region at altitudes of 5,000 to 6,000 feet and is apparently an annual."

49781. SAPINDUS SAPONARIA L. Sapindaceæ.

"(No. 324*a*. El Barranquillo. February 26, 1920.) *Jaboncillo.* Seeds of one of the soapberry trees which grows about 25 feet high, forming a dense crown of deep-green foliage. Its round fruits, about three-fourths of an inch in diameter, can be used in place of soap, but are rarely employed in this way by the natives."

49782. SOLANUM SEAFORTHIANUM Andrews. Solanaceæ.

"(No. 340*a*. El Barranquillo. February 26, 1920. Herb. No. 966.) *Adelfa.* Seeds of a climbing plant, said to produce blue flowers in November."

For previous introductions, see S. P. I. No. 30894.

49783. TECOMA STANS (L.) Juss. Bignoniaceæ. **Yellow tecoma.**

"(No. 337*a*. El Barranquillo. February 26, 1920. Herb. No. 955.) *Flor amarilla.* Seeds of a plant which may be the common *Tecoma stans* of southern California gardens, but my recollection is that the flower of the latter is not of such a deep yellow as this Guatemalan plant. It is a shrub about 15 feet high, producing terminal clusters of brilliant yellow trumpet-shaped flowers about an inch and a half broad at the mouth."

For previous introduction, see S. P. I. No. 43781.

49784. TRINIOCHLOA STIPOIDES (H. B. K.) Hitchc. Poaceæ. **Grass.**
(*Muehlenbergia stipoides* Trin.)

"(No. 229*a*. Antigua. February 17, 1920.) Seeds of a grass from the upper slopes of the Volcan de Agua at altitudes of 7,000 to 8,000 feet. It is about 3 feet high, with fine foliage and small seed."

49745 to 49796—Continued.

49785. VERBESINA MEDULLOSA Robinson. Asteraceæ.

"(No. 323*a*. El Barranquillo. February 26, 1920.) *Sosa blanca.* Seeds of a shrub or small tree about 10 feet high, which produces in August many small white flowers."

49786. ZEA MAYS L. Poaceæ. Corn.

"(No. 344*a*. El Barranquillo. February 26, 1920.) 'Hot country' corn of a small-eared white dent variety."

49787. (Undetermined.)

"(No. 321*a*. El Barranquillo. February 26, 1920. Herb. No. 962.) *Mescal.* Seeds of a medium-sized tree which produces purplish red flowers in August."

49788. (Undetermined.)

"(No. 342*a*. El Barranquillo. February 26, 1920.) *Pimientillo.* Seeds of a tree about 15 feet high which produces an abundance of small yellow flowers in December."

49789. (Undetermined.)

"(No. 339*a*. El Barranquillo. February 26, 1920.) *Quina.* Seeds of a tree about 15 feet high which produces large white flowers in January."

49790. CHEIROSTEMON PLATANOIDES Humb. and Bonpl. Sterculiaceæ.

"(No. 302*a*. Antigua. February 17, 1920. Herb. No. 948.) *Tayuy.* Seeds of one of the characteristic trees of the upper slopes of the Volcan de Agua. It occurs abundantly at altitudes of about 8,000 to 9,000 feet. It reaches about 50 feet in height and often has a very stout trunk; the wood, however, appears to be soft and of little value. The leaves are 5 to 6 inches long and broad, and the flowers about 2 inches broad, are of most peculiar appearance, with the stamens projecting from the center to simulate a small hand."

49791. (Undetermined.)

"(No. 328*a*. El Barranquillo. February 26, 1920.) *Fruta de pava.* Seeds of a medium-sized tree which produces purplish flowers in January."

49792. LUEHEA ENDOPOGON Turcz. Tiliaceæ.

"(No. 330*a*. El Barranquillo. February 26, 1920. Herb. No. 961.) *Tapascahuite.* Seeds of a tree 20 feet high which produces large white flowers in August."

49793. ANTIGONON sp. Polygonaceæ.

"(No. 331*a*. El Barranquillo. February 26, 1920.) *Colación.* Seeds of a handsome climber with heart-shaped leaves and trusses of coral-pink flowers."

49794. (Undetermined.)

"(No. 333*a*. El Barranquillo. February 26, 1920.) *Papalotillo.* Seeds of a tree about 20 feet high. The flowers are said to be white and to be produced in January."

49745 to 49796—Continued.

49795. (Undetermined.)

"(No. 320*a*. El Barranquillo. February 26, 1920.) *Palo giote.* Seeds of a tree up to 40 feet high which produces in January an abundance of small white flowers."

49796. MYROXYLON ELLIPTICUM (Clos) Kuntze. Flacourtiaceæ.
(*Xylosma ellipticum* Hemsl.)

"(No. 301*a*. Antigua. February 17, 1920. Herb. No. 943.) Seeds of a thorny red-berried shrub from the mountainside between Antigua and Santa Maria de Jesus. It looks as though it would make a good hedge plant, the leaves being 2 to 3 inches long, of pleasing appearance, and the thorns quite formidable. When in fruit, the red berries, which are about the size of cranberries or coffee berries, but of a lighter color than the former, add greatly to the attractiveness of the plant. Its ultimate height is about 15 feet."

INDEX OF COMMON AND SCIENTIFIC NAMES.

Acacia spp., 49197, 49198, 49224, 49225, 49582, 49583.
cultriformis, 49484.
farnesiana, 49745.
pycnantha, 49485.
retinodes, 49486.
Adansonia digitata, 49226.
Adelfa, *Solanum seaforthianum*, 49782.
Aegle marmelos. See ***Belou marmelos***.
Aextoxicon punctatum, 49268.
Afzelia quanzensis. See ***Pahudia quanzensis***.
Aira sp., 49613.
Alangium alpinum, 49614.
Albizzia adianthifolia, 49288.
fastigiata. See *Albizzia adianthifolia*.
Alfalfa, *Medicago sativa*, 49156, 49761.
Alpinia sp., 49443.
Amaranthus sp., 49444.
Amomum coccineum, 49527.
Amygdalus davidiana, 49409.
Ananas sativus, 49370, 49714, 49747, 49748.
Andes berry, *Rubus glaucus*, 49332, 49387.
Andropogon caricosus, 49506, 49507.
monticola trinii. See ***Andropogon trinii***.
pachyarthrus, 49508.
pertusus, 49510.
purpureo-sericeus, 49509.
rufus. See *Cymbopogon rufus*.
trinii, 49511.
Anemone vitifolia, 49615.
Annato tree, *Bixa orellana*, 49750.
Annona muricata, 49258.
reticulata, 49199, 49289.
scleroderma, 49371.
squamosa, 49290.
Antigonon sp., 49793.
Apluda aristata, 49512.
Apple, *Malus floribunda*, 49135.
Arachis hypogaea, 49227.
Aralia pseudoginseng. See *Panax pseudoginseng*.
Areca sp., 49528.
horrida. See *Oncosperma horridum*.
tigillaria. See *Oncosperma filamentosum*.
Argemone mexicana, 49749.
Aripin, *Pithecolobium tortum*, 49746.
Arjan, *Terminalia arjuna*, 49565.
Aristolochia sp., 49291.
Ash, Rhodesian, *Burkea africana*, 49230.
Asparagus acutifolius, 49458.
Aulotandra sp., 49477, 49478.
Avena nuda, 49138.
sativa, 49569, 49570.
sterilis, 49568.
Avocado, *Persea americana*, 49730, 49739, 49740, 49764–49776.

Bactris maraja, 49476.
Baikiaea plurijuga, 49228.
Bailador, *Triplaris americana*, 49777.
Bamboo, *Phyllostachys* spp., 49222, 49357, 49505.
Schizostachyum sp., 49175.
Barley, *Hordeum* spp., 49154, 49155.
Barberry, *Berberis* spp., 49125–49130, 49616–49619, 49662.
Bauhinia sp., 49162.
Bean, goa, *Botor tetragonoloba*, 49711.
jack, *Canavali ensiforme*, 49231, 49259.
Lima, *Phaseolus lunatus*, 49312, 49779.
mung, *Phaseolus aureus*, 49159, 49212.
velvet, Florida, *Stizolobium deeringianum*, 49218.
Begonia sp., 49737.
Bel, *Belou marmelos*, 49335.

Belou marmelos, 49335.
Berberis angulosa, 49616.
brachypoda, 49662.
concinna, 49617.
durobrivensis, 49125.
emarginata, 49126.
hookeri, 49618.
oblonga, 49127.
poireti, 49128.
umbellata, 49619.
verruculosa, 49129.
vulgaris, 49130.
wallichiana. See *Berberis hookeri*.
Berry, Andes, *Rubus glaucus*, 49332, 49387.
Betula bhojpattra. See *Betula utilis*.
utilis, 49620.
Bidens pilosa, 49292.
Birch, *Betula utilis*, 49620.
Bixa orellana, 49750.
Blackberry, *Rubus* spp., 49331, 49333, 49388.
Botor tetragonoloba, 49711.
Brachiaria brizantha, 49687.
eruciformis, 49513.
Brachypodium mexicanum, 49751.
Brachystegia sp., 49459.
randii, 49229.
Brassica alba, 49721.
juncea, 49722.
Bromus sp., 49621.
Buckwheat, Sarrasin, *Fagopyrum vulgare*, 49161.
Buddleia davidii, 49663.
variabilis. See *Buddleia davidii*.
Buphane disticha, 49256.
Burkea africana, 49230.

Cacao, *Theobroma cacao*, 49744.
Caesalpinia sp., 49460.
pulcherrima, 49688.
sepiaria, 49200.
Cajan indicum, 49201, 49293.
Calamagrostis sp., 49622.
Calamus sp., 49567.
Callilepis sp., 49384.
Calophyllum hasskarlii, 49529.
Camoensia maxima, 49280.
Canavali ensiforme, 49231, 49259.
Canthium lanciflorum, 49608.
Capsicum annuum, 49717.
Cardiogyne africana, 49319.
Carica candamarcensis, 49473.
papaya, 49260, 49472.
Caryophyllus jambos, 49461.
Cassava, *Manihot esculenta*, 49265, 49267, 49351–49356, 49358, 49359.
Cassia spp., 49294, 49752.
Cassie, *Acacia farnesiana*, 49745.
Cassiope fastigiata, 49623.
Castanopsis hystrix, 49340.
Castor-bean, *Ricinus communis*, 49313, 49366, 49367, 49703.
Casuarina cunninghamiana, 49720.
Cathcartia villosa, 49624.
Cautleya lutea, 49625.
Ceanothus caeruleus, 49753.
Ceara rubber, *Manihot glaziovii*, 49594.
Ceiba pentandra, 49442.
Cenchrus biflorus, 49514.
Chaenomeles lagenaria wilsonii, 49664.
Chaetochloa italica, 49139, 49149.
paniculifera, 49372.
Chamaedorea spp., 49325, 49373, 49406.
Cheirostemon platanoides, 49790.
Cherry, Himalayan, *Prunus cerasoides*, 49647.
sand, *Prunus besseyi*, 49483.
Chloris paraguaiensis, 49515, 49689.
Chupak, *Polygala floribunda*, 49385.
Citrullus vulgaris, 49150–49152, 49202, 49203, 49232.
Citrus spp., 49725–49729.
grandis, 49723, 49724.
webberii, 49712.
Clover, Darling, *Trigonella suavissima*, 49124.
Coccosipsilum repens, 49400.
Coicopio, *Crinodendron hookerianum*, 49269.
Coigüe, *Nothofagus dombeyi*, 49274.
Coix lacryma-jobi, 49345, 49516.
Colación, *Antigonon* sp., 49793.
Colocasia esculenta, 49525.
Combretum apiculatum, 49204.
farinosum, 49754.
Conopharyngia elegans, 49322.
Copaifera coleosperma. See *Copaiva coleosperma*.
Copaiva coleosperma, 49233.
Corn, *Zea mays*, 49334, 49390–49399, 49468, 49605, 49707, 49786.
Cornus paucinervis, 49665.
Corylus avellana, 49176–49193, 49433–49440.
colurna, 49194.
ferox, 49626.
maxima, 49195, 49196.

Cotoneaster acuminata, 49627.
salicifolia floccosa, 49666.
Cotton, *Gossypium* spp., 49208, 49346–49349.
Cowpea, *Vigna sinensis*, 49248.
Coyó, *Persea schiedeana:*
Hempstead, 49330.
Vera Paz, 49329.
Crape myrtle, *Lagerstroemia speciosa*, 49538.
Crataegus crenulata. See *Pyracantha crenulata*.
cullasagensis, 49667.
stipulosa, 49145, 49738.
Crinodendron hookerianum, 49269.
Crotalaria spp., 49295, 49296.
laburnifolia, 49279.
longirostrata, 49755.
maypurensis, 49756.
sagittalis, 49374.
Cucurbita maxima, 49153, 49205, 49206, 49584.
pepo, 49207, 49234, 49482, 49718, 49719.
Cupú-assú. *Theobroma grandiflora*, 49710.
Currant, *Ribes diacantha*, 49682.
Custard-apple, *Annona reticulata*, 49199, 49289.
Cymbopogon rufus, 49585.
Cynodon intermedius, 49411.
Cyperus sp., 49628.
Cyrtostachys lakka, 49530.

Dactyloctenium aegyptium, 49690.
Dahlia maxonii, 49326–49328, 49757.
popenovii, 49758.
Dalechampia sp., 49691.
Danthonia cachemyriana, 49629.
Datura sanguinea, 49405.
Davidia involucrata, 49668.
involucrata vilmoriniana, 49669.
Delonix regia, 49297.
Desmanthus virgatus, 49407.
Deutzia sp., 49671.
vilmorinae, 49670.
Dhaman, *Pennisetum ciliare*, 49521.
Dianella ensifolia, 49531.
Dicentra scandens, 49630.
thalictrifolia 49631.
Digitaria exilis, 49522–49524.
uniglumis, 49692.
Dillenia indica, 49713.
Dinebra arabica, 49517.
Dioscorea alata, 49496.
Diospyros spp., 49235, 49236, 49298, 49299.
ebenaster, 49480.
kaki, 49403.
senegalensis, 49586, 49587.
Dobinea vulgaris, 49632.
Drymophloeus propinquus, 49532.

Echinochloa pyramidalis, 49693.
Edwardsia tetraptera. See *Sophora tetraptera*.
Elaeocarpus prunifolius, 49633.
Elettaria coccinea. See *Amomum coccineum*.
Eleusine aegyptiaca. See *Dactyloctenium aegyptium*.
Enkianthus deflexus, 49634.
himalaicus. See *Enkianthus deflexus*.
Eragrostis spp., 49300, 49301.
cilianensis, 49694.
Eriodendron anfractuosum. See *Ceiba pentandra*.
Erythrina sp., 49588.
rubrinervia, 49759.
Erythroxylon sp., 49302.
Eucryphia cordifolia, 49270.
pinnatifolia, 49271.
Eugenia jambos. See *Caryophyllus jambos*.
Evodia daniellii, 49131.
Exogonium purga, 49257.

Fagopyrum esculentum. See *Fagopyrum vulgare*.
vulgare, 49161.
Fagus dombeyi. See *Nothofagus dombeyi*.
obliqua. See *Nothofagus obliqua*.
procera. See *Nothofagus procera*.
Fenugreek, *Trigonella foenum-graecum*, 49743.
Festuca hookeriana, 49368.
Ficus spp., 49534–49536.
alba, 49533.
hookeri, 49635.
Filbert, *Corylus avellana:*
Atlas, 49192.
Bergeri, 49183.
Cob, 49186.
Cosford, 49433.
Cosford a coque tendre, 49182.
Daviana, 49187.

Filbert—Continued.
D'Alger, 49178.
D'Angleterre, 49188.
De Beynes, 49179.
De Brunswick, 49181.
De Nottingham, 49180.
Des Anglais, 49191.
Du Béarn, 49176.
Duke of Edinburgh, 49434.
Early Prolific, 49435.
Emperor, 49193.
Fertile, 49177.
Fertile de Coutard, 49185.
Fructu albo, 49184.
Golden leaves, 49190.
Kentish, 49436.
Kentish Cob, 49437, 49438.
Large fruited, 49189.
Pearson's Prolific, 49439.
Webb's Prize Cob, 49440.
Fire-lily, *Buphane disticha*, 49256.
Flax, *Linum usitatissimum*, 49141.
Fruta de pava, undetermined, 49791.
Fundi, *Digitaria exilis*, 49522–49524.

Garcinia cornea, 49537.
livingstonei, 49169, 49462, 49589.
mangostana, 49441.
Gladiolus spp., 49715, 49732.
malangensis, 49369.
psittacinus, 49695.
Glycine rubicunda. See *Kennedya rubicunda*.
Gossypium spp., 49346–49349, 49590.
hirsutum, 49208.
Gourd, *Lagenaria vulgaris*, 49591, 49592.
Granadilla, *Passiflora edulis*, 49211, 49475.
sweet, *Passiflora ligularis*, 49146.
Grass, *Aira* sp., 49613.
Andropogon caricosus, 49506, 49507.
pachyarthrus, 49508.
pertusus, 49510.
purpureo-sericeus, 49509.
trinii, 49511.
Apluda aristata, 49512.
black, *Paspalum plicatulum*, 49380.
blady, *Imperata cylindrica*, 49637.
Brachiaria brizantha, 49687.
eruciformis, 49513.

Grass—Continued.
Brachypodium mexicanum, 49751.
Bromus sp., 49621.
Calamagrostis sp., 49622.
Cenchrus biflorus, 49514.
Chaetochloa paniculifera, 49372.
Chloris paraguaiensis, 49515, 49689.
Cymbopogon rufus, 49585.
Cynodon intermedius, 49411.
Dactyloctenium aegyptium, 49690.
Danthonia cachemyriana, 49629.
Digitaria uniglumis, 49692.
Dinebra arabica, 49517.
Echinochloa pyramidalis, 49693.
Eragrostis spp., 49300, 49301.
cilianensis, 49694.
Festuca hookeriana, 49368.
Homolepis aturensis, 49446.
Isachne arundinacea, 49447.
Ischaemum ciliare, 49518.
sulcatum, 49519.
Iseilema anthephoroides, 49520.
Lasiacis oaxacensis, 49448.
Natal, *Tricholaena rosea*, 49217, 49317.
Oplismenus africanus capensis, 49165.
Panicum glutinosum, 49450.
hirsutum, 49376.
madagascariense, 49210.
Paspalum candidum, 49378.
fasciculatum, 49401.
paniculatum, 49377, 49379.
plicatulum, 49380.
virgatum, 49451.
Pennisetum ciliare, 49521.
complanatum, 49381, 49763.
distachyum, 49382.
Phalaris minor, 49158.
Sudan, *Holcus sorghum sudanensis*, 49209.
Triniochloa stipoides, 49784.
Valota insularis, 49455.
Grevillea buxifolia, 49364.
lavandulacea, 49365.
Guaiacum guatemalense, 49760.
Guayacán, *Guaiacum guatemalense*, 49760.
Guindo santo, *Eucryphia pinnatifolia*, 49271.

Gynandropsis speciosa, 49445.
Gynocardia odorata, 49636.

Haematostaphis pierreana, 49344.
Hamamelis mollis, 49132.
Harpagophytum procumbens, 49303.
Hazel, *Corylus ferox*, 49626.
Turkish, *Corylus colurna*, 49194.
Helianthus argophyllus, 49168.
Hemiptelea davidii, 49672.
Hibiscus sp., 49696.
syriacus, 49133, 49134.
Hippocratea obtusifolia, 49253.
Holcus sorghum, 49140, 49237, 49304, 49463, 49464, 49497–49504.
sorghum effusus, 49697.
sudanensis, 49209.
verticilliflorus, 49698.
Homolepis aturensis, 49446.
Hondapara, *Dillenia indica*, 49713.
Hordeum vulgare pallidum, 49154.
vulgare trifurcatum, 49155.
Hotz kor, *Chaetochloa paniculifera*, 49372.
Hypericum patulum henryi, 49673.

Imperata arundinacea. See *Imperata cylindrica*.
cylindrica, 49637.
Impinji, *Ximenia americana*, 49167, 49250, 49467, 49602–49604.
Indigofera spp., 49454, 49699.
Inkulu, *Diospyros senegalensis*, 49586, 49587.
Ipomoea spp., 49238, 49305.
purga. See *Exogonium purga*.
Iris clarkei, 49638.
Isachne arundinacea, 49447.
Ischaemum ciliare, 49518.
sulcatum, 49519.
Iseilema anthephoroides, 49520.

Jaboncillo, *Sapindus saponaria*, 49781.
Jacaranda sp., 49306.
Jasmine, *Jasminum* spp., 49639, 49674.
Jasminum humile, 49639.
nudiflorum, 49674.
Job's-tears, *Coix lacryma-jobi*, 49345, 49516.
Juglans sp., 49375.
Jurún, *Phaseolus lunatus*, 49779.

Kaki, *Diospyros kaki*, 49403.
Kapok, *Ceiba pentandra*, 49442.
Kennedya rubicunda, 49487.

Lagenaria vulgaris, 49591, 49592.
Lagerstroemia flos-reginae. See *Lagerstroemia speciosa*.
speciosa, 49538.
Lasiacis oaxacensis, 49448.
Laurel, *Laurelia sempervirens*, 49272.
Laurelia aromatica. See *Laurelia sempervirens*.
sempervirens, 49272.
Leioptyx congoensis, 49254.
Licuala spinosa, 49539.
Ligustrum confusum, 49640.
delavayanum, 49675–49677.
Lilium giganteum, 49641.
nepalense, 49731.
Lily, *Lilium* spp., 49641, 49731.
Lingue, *Persea lingue*, 49277.
Linospadix petrickiana, 49540.
Linum usitatissimum, 49141.
Lissochilus arenarius, 49479.
Livistona sp., 49541.
Lomatia obliqua. See *Tricondylus obliqua*.
Luehea endopogon, 49792.
Luffa aegyptiaca. See *Luffa cylindrica*.
cylindrica, 49163, 49593.
Lycopersicon esculentum, 49285, 49457.

Macadamia ternifolia, 49307.
Madder, *Rubia cordifolia*, 49652.
Magnolia blumei, 49542.
Mahobohobo, *Uapaca sansibarica*, 49466.
Mahogany bean, *Pahudia quanzensis*, 49241, 49310.
Maiten, *Maytenus boaria*, 49273.
Malus floribunda, 49135.
Mandevilla auriculata, 49449.
Mangapug, *Citrus webberii*, 49712.
Manglietia glauca. See *Magnolia blumei*.
Mangosteen, *Garcinia mangostana*, 49441.
Manihot esculenta, 49265, 49267, 49351–49356, 49358, 49359.
glaziovii, 49594.
utilissima. See *Manihot esculenta*.
Manzanilla, *Crataegus stipulosa*, 49145, 49738.
Markhamia sp., 49164.
Massaranduba, *Mimusops huberi*, 49709.

Massigou, *Uapaca sansibarica*, 49466.
Masuku, *Uapaca sansibarica*, 49466.
Maululu, *Canthium lanciflorum*, 49608.
Maytenus boaria, 49273.
M'bulu, *Cardiogyne africana*, 49319.
Medicago sativa, 49156, 49761.
Melia azedarach, 49762.
Melilotus indica, 49157.
Melothria sp., 49700.
heterophylla, 49733.
Mescal, undetermined, 49787.
M'fwefee, undetermined, 49470.
M'goma, *Ricinodendron rautanenii*, 49213, 49214.
Michelia excelsa, 49642.
lanuginosa, 49643.
Millet, *Chaetochloa italica*, 49139, 49149.
pearl, *Pennisetum glaucum*, 49242, 49702.
Mimosa ceratonia, 49408.
Mimusops huberi, 49709.
marginata, 49308.
zeyheri, 49239.
Mombin, red, *Spondias purpurea*, 49148.
Mombo, *Brachystegia* sp., 49459.
Momordica sp., 49309.
Mongolas, *Terminalia* sp., 49245.
Mora, *Rubus tuerckheimii*, 49147.
Morinda bracteata, 49543.
Morning-glory, *Ipomoea* spp., 49238, 49305.
Morula, *Sclerocarya caffra*, 49215, 49315.
M'pila, undetermined, 49609.
M'seche, undetermined, 49469.
M'tantanvara, undetermined, 49471.
M'tingele, undetermined, 49607.
Muehlenbergia stipoides. See *Trinidochloa stipoides*.
Muermo, *Eucryphia cordifolia*, 49270.
Munkononga, *Garcinia livingstonei*, 49169, 49462, 49589.
Musafa, *Caryophyllus jambos*, 49461.
Mustard, *Brassica juncea*, 49722.
white, *Brassica alba*, 49721.
Mutunguu, *Garcinia livingstonei*, 49462.
Myrica javanica, 49544.
Myristica iners, 49545.
Myroxylon ellipticum, 49796.
Nageia cupressina, 49546.
Nectandra angustifolia, 49547.
Nogal, *Juglans* sp., 49375.
Nomocharis pardanthina, 49281.
Nothofagus dombeyi, 49274.
obliqua, 49275.
procera, 49276.
Oak, *Quercus lyrata* × *virginiana*, 49282–49284.
Oats, *Avena* spp., 49138, 49568–49570.
Ochna sp., 49596.
atropurpurea, 49320.
mossambicensis, 49321.
polyneura, 49595.
pulchra, 49240.
Ochoy, *Paspalum fasciculatum*, 49401.
Odina edulis, 49597.
Oncosperma filamentosum, 49548.
horridum, 49549.
Oplismenus africanus capensis, 49165.
Oreodoxa sp., 49550.
Oryza sativa, 49286.
Otophora spectabilis, 49551.
Oxalis sp., 49701.
Pahudia quanzensis, 49241, 49310.
Palm, *Areca* sp., 49528.
Bactris maraja, 49476.
Cyrtostachys lakka, 49530.
Licuala spinosa, 49539.
Linospadix petrickiana, 49540.
Livistona sp., 49541.
Oncosperma filamentosum, 49548.
horridum, 49549.
Oreodoxa sp., 49550.
pacaya, *Chamaedorea* sp., 49325.
pacayito, *Chamaedorea* spp., 49373, 49406.
Pinanga kuhlii, 49554.
rattan, *Calamus* sp., 49567.
Sabal mauritiaeformis, 49559.
Palo de amor, *Petrea* sp., 49778.
Palo giote, undetermined, 49795.
Panax pseudoginseng, 49644.
Pandanus aurantiacus, 49552.
Panicum aturense. See *Homolepis aturensis*.
brizanthum. See *Brachiaria brizantha*.
glutinosum, 49450.
hirsutum, 49376.
isachne. See *Brachiaria eruciformis*.

Panicum madagascariense, 49210.
oaxacense. See *Lasiacis oaxacensis*.
pyramidale. See *Echinochloa pyramidalis*.
Papalotillo, undetermined, 49794.
Papaya, *Carica papaya*, 49260, 49472.
Paraiso, *Melia azedarach*, 49762.
Paranephelium macrophyllum, 49553.
Parrotia persica, 49136.
Paspalum candidum, 49378.
fasciculatum, 49401.
paniculatum, 49377, 49379.
plicatulum, 49380.
virgatum, 49451.
Passiflora edulis, 49211, 49475.
ligularis, 49146.
serratifolia, 49452.
Peach, *Amygdalus davidiana*, 49409.
Peanut, *Arachis hypogaea*, 49227.
Pear, *Pyrus* spp., 49489–49495.
Pennisetum cenchroides. See *Pennisetum ciliare*.
ciliare, 49521.
complanatum, 49381, 49763.
distachyum, 49382.
glaucum, 49242, 49702.
typhoideum. See *Pennisetum glaucum*.
Pepper, red, *Capsicum annuum*, 49717.
Pereskia aculeata, 49311.
Persea americana, 49730, 49739, 49740, 49764–49776.
donnell-smithii, 49383.
gratissima. See *Persea americana*.
linguc, 49277.
schiedeana, 49329, 49330.
Persimmon, *Diospyros* spp., 49235, 49236, 49298, 49299.
Petrea sp., 49778.
Phalaris minor, 49158.
Phaseolus aureus, 49159, 49212.
lunatus, 49312, 49779.
Phyllostachys mitis, 49357.
nigra. See *Phyllostachys puberula nigra*.
puberula nigra, 49222, 49505.
Picea sp., 49402.
Pigeon-pea, *Cajan indicum*, 49201, 49293.
Pimientillo, undetermined, 49788.
Pinanga kuhlii, 49554.
Pine, white-barked, *Pinus bungeana*, 49142.
Pineapple, *Ananas sativus*, 49370, 49714, 49747, 49748.
Pinus bungeana, 49142.
Piptanthus nepalensis, 49645.
Pithecolobium tortum, 49746.
Pito, *Erythrina rubrinervia*, 49759.
Pittosporum crassifolium, 49474.
Podocarpus cupressina. See *Nageia cupressina*.
Poinciana regia. See *Delonix regia*.
Polyalthia lateriflora, 49555.
Polygala arillata, 49646.
floribunda, 49385.
Polygonum sp., 49556.
Pootia grandifolia. See *Voacanga grandifolia*.
Poplar, *Populus yunnanensis*, 49678.
Populus yunnanensis, 49678.
Posh, *Annona scleroderma*, 49371.
Potato, *Solanum tuberosum*:
America, 49412.
Arran Comrade, 49413.
Victory, 49414.
(China), 49143, 49144.
Dargill Early, 49416.
Edsell Blue, 49418.
Epicure, 49419.
Immune Ashleaf, 49420.
Irish Queen, 49421.
Lochar, 49422.
Majestic, 49423.
Mauve Queen, 49424.
May Queen, 49425.
Midlothian Early, 49426.
Nithscale, 49427.
Resistant Snowdrop, 49428.
Rhoderick Dhu, 49429.
Sharpe's Express, 49430.
The Bishop, 49415.
The Duchess, 49417.
Tinwald Perfection, 49431.
Printzia sp., 49612.
Privet, *Ligustrum delavayanum*, 49675–49677.
Prosopis stephaniana, 49481.
Protea abyssinica, 49465.

Prunus besseyi, 49483.
cerasoides, 49647.
davidiana. See *Amygdalus davidiana*.
puddum. See *Prunus cerasoides*.
Pseudolachnostylis sp., 49243.
Psophocarpus tetragonolobus. See *Botor tetragonoloba*.
Pterocarpus sp., 49244.
Pummelo, *Citrus grandis*, 49723, 49724.
Pumpkin, *Cucurbita maxima*, 49153, 49205, 49206, 49234, 49584.
Cucurbita pepo, 49718, 49719.
Pyracantha crenulata, 49679.
Pyrus spp., 49489–49495.
floribunda. See *Malus floribunda*.
microphylla. See *Sorbus microphylla*.

Quercus lyrata × *virginiana*, 49282–49284.
Quina, undetermined, 49789.

Radal, *Tricondylus obliqua*, 49278.
Randia aculeata, 49386.
dumetorum, 49557.
tomentosa, 49558.
Raspberry, *Rubus* spp., 49174, 49734, 49735, 49741.
Rauli, *Nothofagus procera*, 49276.
Rheum sp., 49410.
Rhododendron sp., 49681.
anthopogon, 49648.
lepidotum, 49649.
setosum, 49650.
smithii, 49680.
Rhubarb, *Rheum* sp., 49410.
Ribes diacantha, 49682.
griffithii, 49651.
Rice, *Oryza sativa*, 49286.
Ricinodendron rautanenii, 49213, 49214.
Ricinus communis, 49313, 49366, 49367, 49703.
Roble, *Nothofagus obliqua*, 49275.
Rosa laxa, 49343.
longicuspis, 49683.
sinowilsoni. See *Rosa longicuspis*.
soulieana, 49684.
Roscoea elatior. See *Cautleya lutea*.
Rose, *Rosa* spp., 49343, 49683, 49684.
Rose-apple, *Caryophyllus jambos*, 49461.
Rose of Sharon, *Hibiscus syriacus*, 49133, 49134.
Rubia cordifolia, 49652.
Rubus spp., 49174, 49388, 49654, 49741.
adenotrichos, 49331.
glaucus, 49332, 49387.
moluccanus, 49653.
paykouangensis, 49734.
swinhoii, 49735.
tuerckheimii, 49147.
urticaefolius, 49333.
Rye, *Secale cereale*, 49160.

Sabal mauritiaeformis, 49559.
Saccharum officinarum, 49261–49264, 49266, 49336–49339, 49341, 49350, 49360–49363.
Sage, *Salvia* spp., 49389, 49742, 49780.
Salacia sp., 49560.
Salvia amarissima, 49780.
lindenii, 49742.
popenoei, 49389.
Sandalwood, false, *Ximenia americana*, 49167, 49250, 49467, 49602–49604.
Sapindus saponaria, 49781.
Sapote, black, *Diospyros ebenaster*, 49480.
Schedonorus hookerianus. See *Festuca hookeriana*.
Schefflerodendron gazense, 49314.
Schizostachyum sp., 49175.
Sclerocarya caffra, 49215, 49315.
Secale cereale, 49160.
Sedge, *Cyperus* sp., 49628.
Sesame, *Sesamum orientale*, 49598.
Sesamum orientale, 49598.
Setaria italica. See *Chaetochloa italica*.
paniculifera. See *Chaetochloa paniculifera*.
Sloanea dasycarpa, 49655.
Solanum sp., 49404.
macrodon, 49656.
seaforthianum, 49453, 49782.
tuberosum, 49143, 49144, 49412–49431.
Sophora tetraptera, 49223.
Sorbus microphylla, 49657.
torminalis, 49432.
Sorghum, *Holcus sorghum*, 49140, 49237, 49304, 49463, 49464, 49497–49504.
vulgare. See *Holcus sorghum*.

Sosa blanca, *Verbesina medullosa*, 49785.
Soursop, *Annona muricata*, 49258.
Spiraea bella, 49658.
japonica acuminata, 49685.
micrantha, 49659.
Spirea, *Spiraea* spp., 49658, 49659, 49685.
Spondias purpurea, 49148.
Spruce, *Picea* sp., 49402.
Squash, *Cucurbita pepo*, 49482.
Stadmannia fraseri, 49561.
Stizolobium deeringianum, 49218.
Stranvaesia davidiana, 49287.
Strychnos sp., 49599, 49600.
Styrax sp., 49562.
hookeri, 49660.
japonicum, 49686.
serrulatum, 49736.
Subin, *Acacia farnesiana*, 49745.
Sugar-apple, *Annona squamosa*, 49290.
Sugar cane, *Saccharum officinarum*, 49261–49264, 49266, 49336–49339, 49341, 49350, 49360–49363.
Sunflower, *Helianthus argophyllus*, 49168.
Swartzia madagascariensis. See *Tounatea madagascariensis*.
Sweet clover, yellow, *Melilotus indica*, 49157.
Swertia hookeri, 49661.

Tamarisk, *Tamarix hispida*, 49137.
Tamarix hispida, 49137.
Tapascahuite, *Luehea endopogon*, 49792.
Taro, *Colocasia esculenta*, 49525.
Tayuy, *Cheirostemon platanoides*, 49790.
Teak, *Tectona grandis*, 49563.
Rhodesian, *Baikiaea plurijuga*, 49228.
Tecoma smithii, 49488.
stans, 49316, 49783.
yellow, *Tecoma stans*, 49316, 49783.
Tectona grandis, 49563.
Terminalia sp., 49245.
arborea, 49564.
arjuna, 49565.
Tetrapleura spp., 49216, 49246, 49247.
Theobroma cacao, 49744.
grandiflora, 49710.
Thunbergia spp., 49166, 49610.
Tigue, *Aextoxicon punctatum*, 49268.
Tokán, *Rubus adenotrichos*, 49331.
Rubus sp., 49388.
uuk, *Rubus glaucus*, 49332, 49387.
yak, *Rubus urticaefolius*, 49333.
Tomato, *Lycopersicon esculentum*, 49285, 49457.
Tounatea madagascariensis, 49170, 49252.
Tricholaena rosea, 49217, 49317.
Tricondylus obliqua, 49278.
Trigonella foenum-graecum, 49743.
suavissima, 49124.
Triniochloa stipoides, 49784.
Triplaris americana, 49777.
Triticum aestivum, 49342, 49571–49578.
durum, 49579, 49580.
turgidum, 49581.
vulgare. See *Triticum aestivum*.
Trochomeria garcini, 49611.

Uapaca sansibarica, 49466.
Undetermined, 49171, 49172, 49221, 49251, 49255, 49323, 49324, 49456, 49469–49471, 49606, 49607, 49609, 49708, 49716, 49787–49789, 49791, 49794, 49795.
Urginea altissima, 49173.
Uteta, *Caesalpinia* sp., 49460.

Valota insularis, 49455.
Verbenilla, *Cassia* sp., 49752.
Verbesina medullosa, 49785.
Vicia sp., 49318.
Vigna spp., 49601, 49704–49706.
sinensis, 49248.
Voacanga grandifolia, 49566.
Voandzeia subterranea, 49249.

Walnut, *Juglans* sp., 49375.
Watermelon, *Citrullus vulgaris*, 49150–49152, 49202, 49203, 49232.
Wheat, common, *Triticum aestivum*, 49342, 49571–49578.
durum, *Triticum durum*, 49579, 49580.
Poulard, *Triticum turgidum*, 49581.

Xanthosoma sagittaefolium, 49526.

Xanthoxylum daniellii. See *Evodia daniellii.*
Ximenia americana, 49167, 49250, 49467, 49602–49604.
Xylosma ellipticum. See *Myroxylon ellipticum.*

Yam, *Dioscorea alata*, 49496.
Yautia. *Xanthosoma sagittaefolium*, 49526.

Zea mays, 49334, 49390–49399, 49468, 49605, 49707, 49786.
Zehneria garcini. See *Trochomeria garcini.*
Zelkova davidii. See *Hemiptelea davidii.*
Ziziphus sp., 49220.
mucronata, 49219.

Issued March, 1923.

U. S. DEPARTMENT OF AGRICULTURE.
BUREAU OF PLANT INDUSTRY.

INVENTORY
OF
SEEDS AND PLANTS IMPORTED
BY THE
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM APRIL 1 TO MAY 31, 1920.

(No. 63; Nos. 49797 to 50647.)



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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CONTENTS.

	Page.
Introductory statement	1
Inventory	6
Index of common and scientific names	91

ILLUSTRATIONS.

		Page.
PLATE	I. The abo, an African anona. (*Annona senegalensis* Pers.; S. P. I. No. 49843)	12
	II. A beautiful Australian vine for pergolas. (*Cissus hypoglauca* A. Gray; S. P. I. No. 49871)	12
	III. The manketti tree of the Belgian Kongo. (*Ricinodendron rautanenii* Schinz; S. P. I. No. 50029)	30
	IV. Natal grass as it grows on the shores of Lake Tanganyika. (*Tricholaena rosea* Nees; S. P. I. No. 50038)	30

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INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM APRIL 1 TO MAY 31, 1920 (NO. 63; NOS. 49797 TO 50647).

INTRODUCTORY STATEMENT.

This inventory, for the period of April and May, 1920, gives some idea of the voluminous stream of plant immigrants which is now pouring into America unchecked by the war. It represents 15 arrivals for every working day of the period, and when one tries to forecast the future of any 15 new arrivals, the size of this undertaking becomes apparent. To find every day for 15 more or less new plants a suitable home in which they will grow, be studied by some observing mind, and have a chance to prove whether or not they are desirable newcomers would be a decided undertaking in itself; but when one considers that each immigrant is not merely a single individual but represents from a dozen cuttings to a hundred thousand seeds, the real difficulties of the undertaking begin to appear. Not only this: There are the immigrants which have come in earlier and which still require attention. To-day these represent a certain proportion of the more than 50,000 arrivals which have been scattered all over America for the past 23 years, during which period this office has attempted to supervise their arrival and distribution.

While 10,000 amateur and professional agriculturists are on the lists of those who want to take care of these immigrants, the limitations of any one experimenter are soon reached, because the testing of a new introduction takes years and requires more money than many people feel they can afford to spend. But the interest in new plants is bound to grow with our appreciation of the fact that they have great wealth-producing power and that our dooryards and parks, our forests and landscapes, are to mean vastly more to our children than they do to us. With that growth is coming a larger number of experimenters and a greater expenditure of time and money upon this phase of American life.

I find it increasingly difficult to single out the most important introductions from 851 arrivals, particularly since so many of them seem important; but perhaps my long, though often superficial,

MAY 22 1923

acquaintance with them may enable me to do it better than the layman himself, and it is with this idea that I continue to prepare these introductory statements.

The cultivation of Job's-tears as a field grain crop has been proposed for tropical and subtropical regions, but I think P. J. Wester has furnished the first report of its yields. In Mindanao, where several varieties are grown by the natives in a limited way, one variety (*Coix lacryma-jobi ma-yuen;* No. 49798) yielded 3,230 pounds per acre.

The bulso (*Gnetum indicum;* No. 49799) is a climber which bears brick-red fruits like grapes, each containing a seed which when roasted tastes like a chestnut. In Java its close relative, *G. gnemon*, is used as a pickle with the "rijs tavel."

The sokwa grass of Nigeria (*Echinochloa stagnina;* No. 49845), which, according to Alfred Thompson, is adapted to low swamp lands and is so sweet that children like to chew it and horses prefer it to Guinea corn, may prove valuable for Porto Rico, Hawaii, or even for the Everglades of Florida.

The guar of Burma (*Cyamopsis tetragonoloba:* Nos. 49864 and 49899 to 49904) is, according to Professor Piper, more drought resistant than any other annual legume and will grow in any part of the country where cowpeas succeed; it may be utilized as hay, or pasturage, or silage; its green pods are also used as a vegetable. It deserves more serious consideration than has heretofore been given it.

Mr. Wester's introduction of the silani (*Vigna lutea;* No. 49870), a new leguminous vine with possibilities as an orchard cover crop for citrus orchards, will interest Florida growers.

The success of the beautiful Australian vine (*Cissus hypoglauca;* No. 49871) on Miss Kate Sessions's place at San Diego, Calif., where it is one of the most attractive of pergola vines, makes its wide distribution most desirable.

H. E. Allanson calls attention to a quick-maturing variety of watermelon (*Citrullus vulgaris:* No. 49872), the seed of which was sent by Mr. Voyeikoff, of Vladivostok. At Chico, Calif., it matured fruits in 45 days from seed.

Capt. F. Kingdon Ward, the English explorer, sends from the Htawgaw Hill tracts of Burma a promising plumlike fruit (No. 49886) which so far has not been determined botanically, but which seems suited to regions of perpetual cool climate and rainy weather, like the Puget Sound region, and is a good table fruit even in its wild state.

The Chilgoza pine (*Pinus gerardiana:* No. 49889), from the dry, arid valleys of the northwestern Himalayas at 6,000 to 12,000 feet altitude, yields a large edible seed suited for table use, and like our

piñon may grow in the valleys of Arizona and California; because of the size of its nuts it may also be valuable commercially.

The Australian quandong (*Mida acuminata;* No. 49893) which is said to have wonderful drought-enduring qualities, growing as it does in the hotter, drier parts of New South Wales, should attract horticulturists of Arizona and California if its fruits, as reported, make preserves resembling that of the guava.

Dr. H. L. Shantz continues in this inventory the notes on material collected by him while attached as Agricultural Explorer of the Bureau of Plant Industry to the Smithsonian expedition to central and East Africa. The hurried nature of his trip of reconnaissance, in which he covered in a year's time an area nearly four times the extent of the whole Atlantic seaboard of the United States, made it impossible for him to get complete data on many of the things he collected, and this fact explains the fragmentary nature of many of his notes.

The remarkable behavior of kafirs and other sorghums and Sudan grass from Africa made it seem possible that strains of these important cereal and forage crops might be found which would be superior to those already introduced. Consequently Doctor Shantz collected samples of these from the various regions which he visited (*Holcus* spp.; Nos. 50008 to 50019 and 50077 to 50079). He also obtained seeds of the mombo tree (*Brachystegia* sp.; No. 50207), the bark of which furnished the natives with cloth before calicos were imported.

Pachylobus sp. (No. 50243), a forest tree bearing nuts that are edible after boiling, and *Ricinodendron* sp. (No. 50270), bearing sweet-fleshed fruits with edible oily kernels, are two other new and promising introductions resulting from Doctor Shantz's exploration.

Dr. E. D. Merrill, director of the Bureau of Science in Manila, has sent in a blue-flowered Lobelia (*L. nicotianaefolia;* No. 50314) which grows to be more than 9 feet tall and should be useful for breeding purposes, even if not adapted for outside culture in this country.

Dr. Carlos Spegazzini, of La Plata, Argentina, has presented 10 species of Prosopis (Nos. 50092 to 50101), leguminous trees and shrubs, the pods of some of which are very valuable as stock feed.

J. Burtt Davy made for us, just before he left South Africa, a collection of trees, shrubs, and grass seeds covering 105 numbers (Nos. 50102 to 50206). Among them are many which may contribute to the afforestation problem of the Hawaiian Islands and several which, because of their edible fruits, may prove of value in California and southern Florida; these include the mupundu (*Parinari mobola;* No. 50167), the mahobohobo (*Uapaca sansibarica;* No. 50190), three species of jujube (*Ziziphus* spp.; Nos. 50196 to 50198), *Balanites aegyptiaca* (Nos. 50120 and 50121); and *Mimusops zeyheri* (Nos. 50163

to 50165). He also sends in nine species of coffee (*Coffea* spp.; Nos. 50625 to 50633) from the Kongo and other parts of Africa.

The South China tung oil is made from the seeds of the mu-yu shu (*Aleurites montana;* No. 50353) and the central China tung oil from that of *A. fordii;* both appear to be used more or less indiscriminately by the varnish trade. Together these oils represent the basic material used by a 25-million-dollar industry, and the culture of these two Chinese trees deserves to be undertaken seriously in America.

G. H. Cave, of Darjiling, India, has presented us with seeds of 15 interesting trees and shrubs from the Himalayas, among which is the *Docynia indica* (No. 50364), a small tree with edible fruits resembling the quince in flavor. This might prove peculiarly adapted to the Puget Sound region, and *Pueraria peduncularis* (No. 50371), a relative of the kudzu vine of Japan, might grow there also.

Mr. Wester sends a new leguminous tree (*Prosopis vidaliana;* No. 50381) which should be worth trying on the Florida beaches.

Dr. Argollo Ferrão sends in a remarkable variety of cassava (*Manihot esculenta;* No. 50388) which is known as the "manioc of 10 years," because it may remain 10 years in the ground and produce roots that weigh more than 500 kilograms (1,102.3 pounds) per tree.

The late Sr. André Goeldi, of Para, Brazil, presented the United States Department of Agriculture with 52 varieties of seeds which he collected at the mouth of the Amazon. Among them is the macaúba palm (*Acrocomia sclerocarpa:* No. 50467), the seeds of which when roasted make a good table nut. Since the genus to which this palm belongs does unusually well in southern Florida, there may be in the macaúba a valuable food tree for that region. The assahy palm (*Euterpe oleracea;* No. 50481), from the fruits of which a wine is made, and the pupunha (*Guilielma speciosa:* No. 50482), whose fruits have a mealy covering which when cooked is said to be more delicate than potatoes or chestnuts and to combine the qualities of both, may prove further valuable additions to the economic palms of Florida. There is also a species of Cissus in the collection, a tropical grape (No. 50474) with fruits having the flavor of the Isabella. It is well worth finding out whether the cutitiribá, a species of Lucuma (*L. macrocarpa;* No. 50487) with fruits 4 inches across, and the cacau-y (*Theobroma speciosa;* No. 50510), a deliciously flavored fruit related to the cacao, will grow in this country. *Oryza latifolia* (No. 50491), a perennial wild rice from Marajo, growing to 8 feet in height and bearing seeds the whole year round, may have value as a forage crop on wet soils.

Hugh Dixson, of New South Wales, has brought to our attention what appears to be a very valuable ornamental climber (*Millettia megasperma;* No. 50518), which resembles the wistaria but has

dark-green foliage and darker purple, sweet-scented flowers. As it will stand 10 degrees of frost, it should thrive remarkably well in California and Florida.

Wilson Popenoe and Otón Jimenez believe they have discovered, near San Jose, Costa Rica, the wild prototype of the Guatemalan race of avocados in what is known there as the aguacate de anis (*Persea americana;* No. 50585), and they predict that it will prove valuable as a stock for the cultivated avocado.

James Birch Rorer, of Guayaquil, Ecuador, has sent in a number of interesting plants from that little-known country, among them the capulin (*Prunus serotina;* No. 50604), or wild cherry, a promising new fruit resembling the Bigarreau type of cherry, refreshing to eat out of hand, and also the naranjilla (*Solanum quitoense;* No. 50607), a solanaceous fruit sold on the markets there.

Harry Johnson has collected from around Coban, Guatemala, some interesting wild plants which should yield valuable forms for cultivation. Among them are five begonias (Nos. 50609 to 50613), a morning-glory (*Ipomoea* sp.; No. 50615) with yellow-throated pink flowers of a thick succulent texture, a tender night-blooming water lily (*Nymphaea blanda;* No. 50617), and a wild solanaceous vine (*Solanum* sp.; No. 50620).

The botanical determinations of seeds introduced have been made and the nomenclature determined by H. C. Skeels; and the descriptive and botanical notes have been arranged by G. P. Van Eseltine, who has had general supervision of this inventory. The manuscript has been prepared by Miss Esther A. Celander and Miss Patty T. Newbold.

David Fairchild,
Agricultural Explorer in Charge.

Office of Foreign Seed and Plant Introduction,
Washington, D. C., October 24, 1921.

INVENTORY.[1]

49797. CACARA EROSA (L.) Kuntze. Fabaceæ. **Yam bean.**
(*Pachyrhizus angulatus* Rich.)

From San Salvador, Salvador. Seeds presented by J. E. van der Laat, Director General of Agriculture. Received April 1, 1920.

"Seeds of the white-flowered *jicama*, which is the best yam bean. It is cultivated widely and is relished very much in the raw state." (*Van der Laat.*)

For previous introduction, see S. P. I. No. 47146.

49798 and 49799.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received April 1, 1920. Quoted notes by Mr. Wester.

49798. COIX LACRYMA-JOBI MA-YUEN (Rom.) Stapf. Poaceæ. **Ma-yuen.**

"Seeds of *adlay*, a grain which I believe is worthy of serious attention in Porto Rico and the Gulf States. Preliminary trials here have yielded at the rate of 3,625 kilos of grain to the hectare (3,230 pounds per acre), the hulled grain of which is 2,610 kilos. An analysis made by the Bureau of Science returned 49.86 per cent starch, 8.23 per cent protein, and 8.87 per cent fat. The returns from the hulled grain were 68.83, 11.27, and 6.65 per cent, respectively. At present *adlay* is grown in a limited way in Bukidnon and Cotabato in Mindanao and in the Mountain Province in Luzon. There are probably some 10 varieties cultivated in these islands."

49799. GNETUM INDICUM (Lour.) Merr. Gnetaceæ.
(*G. funiculare* Blume.)

"The *bulso*, a native woody vine with brick-red fruits in bunches like grapes, each containing a nut which, when roasted, tastes like a chestnut. The nuts should not be eaten raw. This is a close relative to the *banago* (*Gnetum gnemon*)."

49800. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.**
(*T. vulgare* Vill.)

From Rieti, Italy. Presented by Prof. Nazarene Strampelli, director, R. Stazione Sperimentale di Granicoltura. Received April 1, 1920.

Carlotta Strampelli. A very early winter wheat originated by Professor Strampelli, sown upon about 47,000 acres in 1918–19. Secured for Dr. C. E. Leighty, Agronomist in Charge of Eastern Wheat Investigations, for use in experimental work.

[1] All introductions consist of seeds unless otherwise noted.

It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in these inventories are those which the material bore when received by the Office of Foreign Seed and Plant Introduction; and further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in these inventories will in many cases, undoubtedly, be changed by the specialists interested in the various groups of plants and the forms of the names brought into harmony with recognized American codes of nomenclature.

49801 to 49803. Holcus sorghum L. Poaceæ. Sorghum.

(*Sorghum vulgare* Pers.)

From Kaduna, Northern Provinces, Nigeria. Seeds presented by P. H. Lamb, Director of Agriculture, through C. V. Piper. Received April 7, 1920. Notes furnished by H. N. Vinall, Office of Forage-Crop Investigations.

49801. "Native name *fara-fara*. Variety with loose panicles about 13 inches long and 3 inches in diameter. Seeds white, flat, rotating in the glumes and shattering freely like *shallu;* glumes black, spreading, and involute."

49802. "Native name *kaura*. Variety with rather compact panicles like kafir, 14 to 15 inches long and 2½ to 3 inches wide. Seeds somewhat larger than kafir, of a very peculiar yellowish white color like pop corn, and 60 to 75 per cent exserted from the straw-colored glumes."

49803. "Native name *jauari*. A variety with loose panicles about 15 inches long and 3 inches wide. Much like the *fara-fara* except that the seeds are red instead of white. Resembles a red-seeded *shallu*."

49804 to 49813.

From Paris, France. Seeds presented by D. Bois, Professeur de Culture, Muséum d'Histoire Naturelle. Received April 27, 1920, for use in rust investigations.

49804. Triticum cylindricum (Host.) Ces. Pass. and Gib. Poaceæ. **Grass.**

"A slender tufted suberect European annual, 25 to 50 centimeters tall, with unbranched culms, narrow, flat, rough blades, and solitary slender cylindrical spikes 5 to 15 centimeters long." (*Agnes Chase.*)

49805. Bromus macrostachys lanuginosus (Poir.) Coss. and Dur. Poaceæ. **Grass.**

An erect Bromus with lanceolate, pointed, somewhat compressed woolly spikelets. Native to the Mediterranean region. (Adapted from *Poiret, Encyclopédie Méthodique Botanique, supplement, vol. 1, p. 703.*)

For previous introduction, see S. P. I. No. 16042.

49806. Bromus madritensis L. Poaceæ. **Grass.**

A tall, tufted, compact grass locally adventive from Europe.

49807. Hordeum maritimum Roth. Poaceæ.

A species of barley grass occurring on the seacoasts of western Europe and in the Mediterranean region, extending northward to Denmark. It is known as "sea barley," and in England it is also called "squirreltail grass." It occurs in meadows, especially in brackish land along the seacoast, but is also found sometimes in mountainous regions. (Adapted from *Bentham and Hooker, Handbook of British Flora, 6th ed., p. 528,* and *Boissier, Flora Orientalis, vol. 5, p. 687.*)

49808. Hordeum vulgare coeleste L. Poaceæ. **Barley.**

This is probably the barley which, in Europe at least, was formerly the most widely cultivated form.

49809. Clematis integrifolia L. Ranunculaceæ. **Clematis.**

An erect herb, bearing rather narrow, blue, leathery flowers.

For previous introduction, see S. P. I. No. 32239.

49810. Clematis viticella L. Ranunculaceæ. **Clematis.**

A European climber, 8 to 12 feet high, with blue, purple, or rose-purple flowers, a leading garden clematis.

49811. Ranunculus acris L. Ranunculaceæ.

The tall or meadow buttercup.

49804 to 49813—Continued.

49812. RANUNCULUS BULBOSUS L. Ranunculaceæ.

A perennial about 1 foot high, one of the common field buttercups: naturalized in the United States from Europe.

49813. THALICTRUM MEDIUM Jacq. Ranunculaceæ.

A European plant with a leafy stem and spreading panicles of nodding flowers.

49814. SYNTHERISMA SANGUINALIS (L.) Dulac. Poaceæ. Grass.

From Kirkee, Poona, India. Seeds presented by William Burns, Government economic botanist. Numbered June, 1920.

A form introduced for experimental work by the Office of Forage-Crop Investigations.

49815 to 49823.

From Johannesburg, South Africa. Seeds presented by J. Burtt Davy, Vereeniging. Received April 22 and 28, 1920. Quoted notes by Mr. Burtt Davy.

49815. ASPARAGUS LARICINUS Burchell. Convallariaceæ.

"A fine bushy plant, 5 feet high: ornamental and possibly edible: hardy."

49816. CAILLIEA NUTANS (Pers.) Skeels. Mimosaceæ.
(*Dichrostachys nutans* Benth.)

"Hardwood, small tree for Hawaii."

49817. ERYTHRINA CAFFRA Thunb. Fabaceæ.

"Deciduous, ornamental, red-flowered tree: grows quickly and easily from cuttings. Used for live fences. Sensitive to frost. Grows on dry, rocky hills; 20-inch rainfall."

49818. LEBECKIA sp. Fabaceæ.

"Perennial legume; winter region rainfall area: Hermanus, Cape Province."

49819. PENTZIA INCANA (Thunb.) Kuntze. Asteraceæ. Karroo bush.

"Good karroo; splendid sheep feed for low-rainfall region."

49820. PHASEOLUS ACUTIFOLIUS LATIFOLIUS G. F. Freeman. Fabaceæ. Tepary bean.

"Small bean; very prolific. Used as dry beans in place of haricots."

49821. SPOROBOLUS sp. Poaceæ. Grass.

"A useful grass."

49822. VANGUERIA INFAUSTA Burchell. Rubiaceæ.

"*Misple.* Edible fruit worth improvement: grows in frostless localities on dry, rocky hills, with rainfall of about 20 inches (summer precipitation)."

49823. VITIS sp. Vitaceæ. Grape.

"Wild grape from Bushman's River, Alexandria Division, Cape Province. Edible and worth careful cultivation in the United States."

49824. COLOCASIA ESCULENTA (L.) Schott. Araceæ. Taro.

From Honolulu, Hawaii. Tubers presented by R. A. Goff, through J. M. Westgate, agronomist in charge, Hawaii Experiment Station. Received May 13, 1920.

"*Kuoho.* This is one of the most largely grown upland taros in the vicinity of Hilo, Hawaii. The buds, skin, and the flesh immediately beneath the skin are bright red. The flesh is very acrid in the raw state, but this quality is destroyed in cooking and

the taro becomes mealy and of good flavor; the flesh is grayish when cooked. The *Kuoho* taro, like other commercial varieties in Hawaii, is used mostly for making poi, the great Hawaiian dish." (*R. A. Young.*)

49825. DIOSCOREA ALATA L. Dioscoreaceæ. **Yam.**

Grown with other unidentified yams under S. P. I. No. 45990 at the Plant-Introduction Garden, Brooksville, Fla., since 1918, and numbered separately on May 15, 1920, to facilitate distribution.

"A white-fleshed yam of excellent quality. It cooks perfectly white and when mashed and beaten with milk is fully equal to the best white potato. Tested after about four months in storage." (*R. A. Young.*)

49826. COLOCASIA ESCULENTA (L.) Schott. Araceæ. **Taro.**

Corm presented through Dr. David Griffiths by A. Miller, of the American Bulb Co., Chicago, Ill., who obtained it from Japan. Received May 18, 1920.

"A taro which forms a multiple-headed nonacrid corm." (*R. A. Young.*)

49827. ANACARDIUM OCCIDENTALE L. Anacardiaceæ. **Cashew.**

From the city of Panama, Panama. Nuts presented by Sr. Ramon Arías-Feraud. Received April 1, 1920.

"The cashew has fruited successfully at Miami and Coconut Grove, Fla., and should be more widely planted, both for its aromatic fruits, which can be used in a variety of ways, and for its edible seed, known as cashew nut. It is a variable plant, but so far as known, selected varieties have not yet been propagated vegetatively." (*Proceedings of the American Pomological Society, 1915, p. 192.*)

49828 to 49833. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

From Yokohama, Japan. Beans presented by Robert Fulton & Co. Received April 2, 1920. Quoted notes by Mr. Fulton.

49828. "*Kuro mame* (black soy bean)."

49829. "*Kuro Teppo mame* (round, middle-late, black soy bean)."

49830. "*Nakate mame* (middle-late, white soy bean), seed larger than *Wase mame*."

49831. "*Okute mame* (late white soy bean)."

49832. "*Shiro daizu* (white soy bean)."

49833. "*Wase mame* (summer bean), small seeded early white."

49834. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

From Aizu Wakamatsu, Japan. Beans presented by Rev. Christopher Noss. Received April 2, 1920.

"*Ogon daizu* (golden soy bean)." (*Noss.*)

The oil of the bean is used for frying, as a butter substitute, for lubricating, for waterproofing clothes, for medicine, and in the manufacture of soap, candles, guncotton, and artificial rubber. The residue after the oil has been extracted has been used for cattle feed, but is now mixed with wheat flour for food purposes. The entire bean is slightly roasted, pulverized, and mixed with flour to make light cakes and to give flavor to boiled rice; it is cheaper and more nutritious than flour. (Adapted from *Parry, Travel Sketches, Japan Advertiser, January 25, 1920.*)

49835. ANANAS SATIVUS Schult. f. Bromeliaceæ. **Pineapple.**

From Kabalo, Belgian Kongo. Collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received April 2, 1920.

"(Kabalo, February, 1920.) Suckers from pineapples grown about native cabins." (*Shantz.*)

49836 to 49839.

From Elizabethville, Belgian Kongo. Collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received April 3, 1920. Quoted notes by Doctor Shantz.

49836. AGAVE AMERICANA L. Amaryllidaceæ.

"(No. 364. Elizabethville. December 27, 1919.) One of the chief fiber plants of this section; the fiber is said to be whiter than sisal, which is also grown here."

49837. AGAVE SISALINA Perrine. Amaryllidaceæ.

"(No. 365. Elizabethville. December 27, 1919.) This plant does very well here, producing leaves 5 feet long, but the market is not good."

49838. MANIHOT ESCULENTA Crantz. Euphorbiaceæ. **Cassava.**
(*M. utilissima* Pohl.)

"(No. 363. Elizabethville. December 27, 1919.) This is a cool country for Manihot, and these plants may prove to be better for cool climates than those grown in South America or the lower Kongo. Here it is one of the principal articles of native diet. Its worst enemy is the porcupine."

49839. (Undetermined.)

"(Elizabethville, December, 1919.) Three small tubers."

49840. ERIOBOTRYA JAPONICA (Thunb.) Lindl. Malaceæ. **Loquat.**

From Olive, Calif. Cuttings presented by M. Payan. Received April 6, 1920.

Eulalia. This variety was originated by Mr. Payan from seeds of the *Advance* variety planted by him in 1897. It is reported to be a rather vigorous grower, spreading and productive, and thus far has shown no blight. The following is a detailed description of the fruit:

Form truncate pyriform to obovoid pyriform, borne in large, rather loose terminal clusters on stout woolly stems inserted without depression; surface smooth, sparsely covered with light down; apex depressed; basin irregular, abrupt, corrugated; calyx segments broad, short, downy, converging; eye medium, partially open; color orange-yellow, blushed, and washed with red when tree ripened, and overspread with a thin bloom; dots numerous, aureoled, light gray; skin thick, tough, acid; flesh pinkish, translucent, melting, tender, very juicy; seeds of medium size, rather numerous; flavor subacid; quality good. Season, February to May in Orange County, Calif. (Adapted from *Yearbook, U. S. Department of Agriculture, 1905, p. 504.*)

49841 and 49842.

From New South Wales, Australia. Seeds presented by Hugh Dixson, Abergeldie. Received April 1, 1920. Quoted notes by Mr. Dixson.

49841. ANGOPHORA CORDIFOLIA Cav. Myrtaceæ.

"An Australian plant which grows in rather poor sandy sandstone country, seldom above 8 feet in height. A plant I have flowered in two years at about 3 feet high; it has large bunches of cream-white eucalyptuslike flowers with honey perfume, very attractive to bees and other insects. Young plants must not be cut back, for there is apparently no bud at the base of the leaves till it

49841 and 49842—Continued.

reaches flowering stage. These seeds are about 2 years old. I have raised plants from this lot within the past month. Ten degrees of frost should not hurt them when above the seedling stage."

49842. EUCALYPTUS FICIFOLIA F. Muell. Myrtaceæ.

"A western Australian plant, commonly known as the red flowering gum. It will take at least five or six years to reach the flowering stage, but it is a blaze of scarlet when it does. The few trees I have seen flowering in the vicinity of Sydney were not above 10 to 15 feet high, with about the same spread. I think that they have been checked to make them spread. They grow in any fair soil, and 10 degrees of frost should not hurt the plants when above seedling stage. The seed takes three years to ripen, though I have just raised a plant or two from 2-year-old capsules grown near here."

A rare and showy plant with a striking display of brilliant scarlet flowers in branching heads. They are produced from a cup-shaped receptacle provided with a capsule which falls off as the flowers expand. When the flower is fully open the green interior of the receptacle is seen, which adds to the beauty of the flower. The gray-green leaves, with red midribs, are also handsome. (Adapted from *The Garden, vol. 71, p. 441.*)

49843 to 49846.

From Yola, Northern Provinces, Nigeria. Seeds presented by Alfred Thompson. Received April 2, 1920. Quoted notes by Mr. Thompson.

49843. ANNONA SENEGALENSIS Pers. Annonaceæ. **Abo.**

"The natives call this 'wild papaw.' It is the nicest wild fruit we have in our part of Africa."

"A shrub or tree, sometimes attaining a height of 8 meters, indigenous to a large part of tropical Africa. It ascends Mount Ruwenzori to an altitude of 2,600 meters. The fruit is 4.5 centimeters in diameter, yellowish or orange colored, and much esteemed by some travelers. It is believed that the wood of this species was used by the negro tribes on the upper Nile for making fire by friction as early as 2,900 B. C." (*P. J. Wester.*)

For previous introduction, see S. P. I. No. 47214.

A fruiting shrub of this species is shown in Plate I.

49844. ARACHIS HYPOGAEA L. Fabaceæ. **Peanut.**

"They grow a lot of peanuts in this part of Africa, but I do not think they are as good as those grown in America."

For previous introduction, see S. P. I. No. 47865.

49845. ECHINOCHLOA STAGNINA (Retz.) Beauv. Poaceæ. **Grass.**

"The natives call this grass 'sokwa.' It is the best kind of grass we have in this part of Africa. The horses as a rule will eat this grass before they will eat guinea corn. It is sweet like sugar cane, and the children like to chew it. It grows in low swamp land and in the wet season is often covered with 7 feet of water. When the water goes down the natives cut it or turn the cattle on it. One thing against it is that it grows to a height of about 7 feet and when the water goes down it lodges so that to cut it with a machine would be very hard."

For previous introduction, see S. P. I. No. 48427.

49846. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"The African cotton is very poor, as you can see by the specimen I am sending you."

49847 to 49849.

From Foochow, Fukien, China. Cuttings presented by C. R. Kellogg, through J. B. Norton. Received April 3, 1920. Quoted notes by Mr. Kellogg.

49847. ACTINIDIA sp. Dilleniaceæ.

"(No. 1, January 26, 1920.) From an old house in Kuliang."

49848. ACTINIDIA sp. Dilleniaceæ.

"(No. 2, January 26, 1920.) Near an old potato field, Kuliang."

49849. FICUS sp. Moraceæ. **Fig.**

"A wild fig."

49850. CAJAN INDICUM Spreng. Fabaceæ. **Pigeon-pea.**

From Honolulu, Hawaii. Seeds presented by J. M. Westgate, director, Agricultural Experiment Station. Received April 5, 1920.

"White variety; germination 25 per cent. March 3, 1920." (*Westgate.*)

49851. CITRUS sp. Rutaceæ.

From Nagpur, Central Provinces, India. Budwood presented by J. C. Leslie, superintendent, Government gardens. Received April 5, 1920.

R. S. Woglum, of the Bureau of Entomology, visited India in 1913, and states concerning this orange: "The *Nagpur* orange is a large, loose-jacketed orange of the tangerine group."

49852 and 49853.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received April 6, 1920.

49852. BARLERIA LUPULINA Lindl. Acanthaceæ.

A very handsome hothouse plant, native to Mauritius, almost always in flower and particularly remarkable for its rich, deep-green, lanceolate leaves marked with bright-red midribs. It forms a very compact leafy bush 2 feet in height, is not attacked by common hothouse insects, thrives in almost any soil with little or no cultivation, and is readily propagated from cuttings. (Adapted from *Edwards's Botanical Register, pl. 1483.*)

49853. BARLERIA PRIONITIS L. Acanthaceæ.

An attractive shrub, native to Asia and tropical Africa, 2 to 3 feet in height, with bright orange-yellow flowers. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting, p. 391.*)

For previous introduction, see S. P. I. No. 20974.

49854 to 49857.

From Kulare, via Cairns, Queensland, Australia. Seeds presented by J. A. Hamilton. Received April 6, 1920. Quoted notes by Mr. Hamilton, unless otherwise specified.

49854. CASUARINA TORULOSA Ait. Casuarinaceæ.

The wood of this tree is close grained and very prettily marked. It is used for cabinetwork and produces very superior shingles. Handsome veneers are obtained from the wood. (Adapted from *Maiden, Useful Native Plants of Australia, p. 400.*)

For previous introduction, see S. P. I. No. 30380.



THE ABO, AN AFRICAN ANONA. (ANNONA SENEGALENSIS PERS.; S. P. I. No. 49843.)

This species is said to vary remarkably, some forms being low shrubs not more than 2 or 3 feet in height, like the one shown above, and others trees 30 feet tall. The yellowish or orange-colored fruits, about the size of small apples (2 to 2½ inches across), have a delicious flavor, which makes them very popular with travelers in tropical Africa. If this shrub will bear in southern Florida or California it may become a valuable winter fruit in those regions. (Photographed by Dr. H. L. Shantz, Kafue, Northern Rhodesia, November 21, 1919; P36765FS.)



A BEAUTIFUL AUSTRALIAN VINE FOR PERGOLAS. (CISSUS HYPOGLAUCA A. GRAY: S. P. I. No. 49871.)

This handsome Australian climber is evergreen in San Diego, Calif., and will probably hold its foliage whereever it can be grown. The black fruits, which are produced abundantly, add greatly to its attractiveness. The plants will endure some frost, and it is not unlikely that strains suitable for most of our Southern States can be developed. (Photographed by David Fairchild, San Diego, Calif., October 12, 1919; P25718FS.)

49854 to 49857—Continued.

49855. EUCALYPTUS sp. Myrtaceæ.

"*Flooded gum.* This species likes plenty of moisture, but grows on poor soil. It grows very straight and is the largest eucalyptus which grows on this table-land."

49856. EUCALYPTUS TERETICORNIS J. E. Smith. Myrtaceæ.

"This must be fairly hardy, as we get rather hard frost here at night in winter. The most noticeable feature in the habit of *Eucalyptus tereticornis* is that of flowering in the winter; last winter the trees began flowering at the end of May and trees were in flower until the end of September."

For previous introduction, see S. P. I. No. 38728.

49857. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean.**

"Green Chinese variety."

49858. TRICHOSANTHES QUINQUANGULATA A. Gray. Cucurbitaceæ.

From Littleriver, Fla. Seeds presented by J. J. Soar, Littleriver Nurseries, through Dr. David Fairchild. Received April 7, 1920.

"These seeds were given to me by Mr. Soar, who says that the plant came from the Philippines. It is the showiest gourd I have ever seen, being a bright red, redder than the reddest apple. As a decorative plant it should be very valuable, and the fruits would make the prettiest kind of decorations for Christmas trees." (*Fairchild.*)

For previous introduction, see S. P. I. No. 43266.

49859 to 49860.

From Melbourne, Victoria. Seeds presented by F. H. Baker. Received April 7, 1920.

49859. DORYANTHES PALMERI W. Hill. Amaryllidaceæ.

A gigantic showy amaryllid with very numerous ribbed leaves 6 to 8 feet long and 4 to 6 inches wide. The stem or scape is 8 to 10 feet high and bears a compact inflorescence 3 feet long, composed of short, few-flowered spikes. The scarlet perianth segments are pale red within. Native to New South Wales. (Adapted from *Curtis's Botanical Magazine, pl. 6665.*)

For previous introduction, see S. P. I. No. 23433.

49860. EUCALYPTUS ALPINA Lindl. Myrtaceæ.

A rare, slow-growing, shrubby eucalypt with stout branches, thick, oval, or roundish shining dark-green leaves, and rather large almost hemispherical fruits. It is restricted in distribution to the summit of Mount William, Western Australia, at an altitude of over 4,000 feet. It endures quite a cold climate and braves sharp frosts and snowstorms several months in the year. (Adapted from *Mueller, Eucalyptographia, vol. 2, p. 1.*)

For previous introduction, see S. P. I. No. 38709.

49861. ANANAS SATIVUS Schult. f. Bromeliaceæ. **Pineapple.**

From the City of Mexico, Mexico. Suckers presented by the Dirección de Agricultura. Received April 8, 1920.

Guatemala Spineless White.

"This variety has a number of points which would commend it for our use; it is spineless, ripens early, has a delicious flavor, and is apparently a good shipper." (*P. H. Rolfs.*)

For previous introduction, see S. P. I. No. 14452.

49862. PYRUS CALLERYANA Decaisne. Malaceæ. **Pear.**

Seeds collected under the direction of Prof. J. H. Reisner, of Nanking, China. Received April 8, 1920.

This seed is a small quantity reserved from a shipment ordered by this office for Jackson & Perkins, of Newark, N. Y., who desired to conduct experiments with *Pyrus calleryana* as a stock for our common pears. According to Professor Reisner, it is very difficult to secure pure seed of this species. This lot was collected about 40 miles from Nanking. Every effort was made to secure seed only from authentic trees of *Pyrus calleryana*.

49863. BICHEA sp. Sterculiaceæ.

(*Cola* sp.)

From Malele, Belgian Kongo. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received April 3, 1920.

"(No. 522. Malele. January 31, 1920.) Called by the whites 'native potato,' but the natives say it grows on a large tree. The pod is about 6 inches long with two rows of very large seeds: they are said to be very good food. The old pods are often gathered from the forest floor, and this has probably resulted in the use of the term 'native potato.' " (*Shantz.*)

49864. CYAMOPSIS TETRAGONOLOBA (L.) Taub. Fabaceæ. **Guar.**

(*C. psoraloides* DC.)

From Mandalay, Northern Circle, Burma, India. Seeds presented by E. Thompstone, Deputy Director of Agriculture. Received April 12, 1920.

"An erect East Indian annual legume with long straight stems bearing an enormous number of pods which do not burst open at maturity. The plant is usually 3 or 4 feet high, but under favorable conditions it reaches a height of 5 to 6 feet. Each pod contains about seven pale angular seeds.

"In India the plant is grown both for green forage and for the seeds which are used mainly to fatten cattle, and also as human food. The green pods are also used as a vegetable in the same manner as string beans.

"Guar may be grown in any part of the country where cowpeas succeed and is more drought resistant than any other annual legume. It may be utilized as hay, pasturage, or silage." (C. *V. Piper.*)

For previous introduction, see S. P. I. No. 43503.

49865. PASPALUM FASCICULATUM Willd. Poaceæ. **Grass.**

From Coban, Guatemala. Seeds presented by Gustav Helmrich at the request of Wilson Popenoe. Received April 19, 1920.

"*Oxay.* This grass is used here as cattle feed. It is generally propagated by suckers: among thousands of plants very few produce any flowers, and I do not know if the seeds germinate." (*Helmrich.*)

49866 to 49869.

From Christiania, Norway. Seeds presented by Dr. N. Wille, director, Botanic Garden. Received April 25, 1920.

49866. ANCHUSA OFFICINALIS L. Boraginaceæ.

The common European alkanet, a biennial or perennial plant 1 to 2 feet high, with hairy leaves and bright-blue or purple flowers opening in pairs on loose one-sided spikes. Effective in masses and of easy cultivation.

49866 to 49869—Continued.

49867. CERINTHE MINOR L. Boraginaceæ.

A European plant with yellow or purple spotted flowers in long racemes. (Adapted from *Boissier, Flora Orientalis, vol. 4, p. 148.*)

49868. RANUNCULUS GLACIALIS L. Ranunculaceæ.

A plant 3 to 6 inches in height, with beautiful silky white flowers suffused beneath with purple; native to the Arctic regions of Europe, Asia, and America, at altitudes of 6,500 to 13,000 feet. (Adapted from *Gardeners' Chronicle, third series, vol. 53, p. 117.*)

49869. THALICTRUM ANGUSTIFOLIUM L. Ranunculaceæ.

A plant from southern and middle Europe, with 3-parted leaves and flowers in dense corymbs. (Adapted from *Boissier, Flora Orientalis, vol. 1, p. 9.*)

49870. VIGNA LUTEA (Swartz) A. Gray. Fabaceæ.

(*V. retusa* Walp.)

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received April 27, 1920.

"Seeds of the *silani*, a native perennial, trailing, and climbing vine which I have recently domesticated, principally for trial as a cover crop. It is easily grown from cuttings, and until it becomes too common it could be used as an ornamental climber in countries where it does not grow wild." (*Wester.*)

For previous introduction, see S. P. I. No. 31607.

49871. CISSUS HYPOGLAUCA A. Gray. Vitaceæ.

(*Vitis hypoglauca* F. Muell.)

From San Diego, Calif. Seeds presented by Miss Kate Sessions. Received May 7, 1920.

An Australian evergreen climber attaining an enormous length, forming when old a very stout stem, and bearing black berries which are the size of small cherries. The plant endures slight frost, though evergreen. It is best in cool climates to keep seedlings for two or three years under shelter, so that sufficient development of the woody stem may take place in the plant subsequently to resist some degree of frost. This species may perhaps be vastly changed by continued culture. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 563.*)

The use of this vine on a pergola is shown in Plate II.

49872 and 49873. CITRULLUS VULGARIS Schrad. Cucurbitaceæ.

Watermelon.

From Chico, Calif. Seeds from plants grown from a shipment of seeds from A. D. Voyeikoff, Vladivostok, Siberia, May 17, 1920. Numbered for convenience in distribution June 15, 1920.

"This seed was planted June 15. On August 1 (45 days after planting the seed) fruits were ripe. The melons are not large, ranging from about 8 to 12 or 14 inches in diameter, nearly round, and of a purplish green color, very unusual and peculiar in appearance. The quality is fair to good. While this melon would not compete with the commercial types developed and grown here in a section highly favorable to melon production, the short season required for its development would seem to me to make it a valuable thing for many sections.

"In collecting the seed one vine was found with melons having yellow flesh; the remainder had red flesh." (*H. E. Allanson.*)

49872. Red-fleshed. **49873.** Yellow-fleshed.

49874 and 49875.

From Elizabethville, Belgian Kongo. Bulbs collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received April 10, 1920. Quoted notes by Doctor Shantz.

49874. GLORIOSA sp. Melanthiaceæ.

"(No. 360. December 26, 1919.) This is the most prominent lily at this period. Some of the plants bear as many as seven or eight flowers which vary in color from all red to red and yellow. It is an exceptionally good lily for cut flowers, since it keeps perfectly for a long time."

49875. OXALIS PUNCTATA GLABRATA Sond. Oxalidaceæ. **Oxalis.**

"(No. 361. December 26, 1919.) A small pink-flowered oxalis now in bloom; it is small but forms attractive tufts, the flowers extending a short distance above the leaves. It grows most commonly on ground cleared of trees and brush. The flowers appear at the beginning of the rainy season."

49876 to 49882.

From Kindu, Belgian Kongo. Collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received April 10, 1920. Quoted notes by Doctor Shantz.

49876. ARACHIS HYPOGAEA L. Fabaceæ. **Peanut.**

"(No. 501. January 26, 1920.) Peanuts grown by the natives; one of the staple crops."

49877. CURCUMA LONGA L. Zinziberaceæ.

"(No. 520. January 28, 1920.) Roots of the plant turmeric; grown by the natives."

49878. ELAEIS GUINEENSIS Jacq. Phœnicaceæ. **Oil palm.**

"(No. 495. January 26, 1920.) Seeds of the oil palm which is the chief palm of this region and the most important native plant."

49879 and 49880. ORYZA SATIVA L. Poaceæ. **Rice.**

49879. "(No. 489. January 26, 1920.) Rice grown with corn on the east side of the river. Often 5 feet high and no straighthead."

49880. "(No. 502. January 26, 1920.) Rice grown by natives. This is the most important crop of this section; it is grown following corn (apparently sown at the same time) and on the higher, better-drained land; presents a fine appearance. I have noticed no disease on either rice or corn."

49881. VOANDZEIA SUBTERRANEA (L.) Thouars. Fabaceæ.

"(No. 497. January 26, 1920.) The native groundnut of Africa; by no means as common as the peanut. The seeds are boiled with the husks on before they are ripe and are a fair substitute for the potato, but have a flavor slightly similar to that of the peanut."

For previous introduction, see S. P. I. No. 44817.

49882. ZEA MAYS L. Poaceæ. **Corn.**

"(No. 488. January 26, 1920.) Grown by the natives as an early crop with rice, on the east side of the river."

49883. DIOSPYROS LOTUS L. Diospyraceæ.

From Yokohama, Japan. Seeds received at Chico, Calif., from the Yokohama Nursery Co., April 12, 1920.

Introduced for use as rootstocks for the oriental persimmons in semiarid and alkali sections of the United States.

For previous introduction, see S. P. I. No. 44688.

49884 and 49885.

From New York, N. Y. Seeds presented by J. W. Pincus. Received April 12, 1920.

49884. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

"This is the so-called Rozendaal clover, as grown in Holland. It has no hairs on the stems or leaves and is considered very much superior to any clover grown in this country. It could be raised successfully in localities where clover is grown under irrigation. In other places, owing to the abundance of native hairy clovers, the bees cross-fertilize the plants and it is impossible to get them pure." (*Pincus.*)

49885. VICIA SATIVA L. Fabaceæ.

[Sent in as lupine seed.]

49886. (Undetermined.)

From India. Seeds collected by Capt. F. Kingdon Ward, London, England. Received April 13, 1920.

"(Htawgaw Hill tracts, Burma, India. June, 1919.) A small tree 30 feet high, which grows wild in the forest on the northeast frontier of Burma, India, and bears fruit the size of a small plum. It is grown by the Lisus of the Htawgaw Hill tracts in clayey soil (disintegrated granite) in open clearings in villages at altitudes of 5,000 to 6,000 feet. The fruit is excellent, slightly acid, thirst quenching, first-rate for cooking or jam, and good as a table fruit. It ripens in June, just before the rains break. The climate is wet at all seasons, the winters cold (30° to 40° F.), and the summers warm (70° to 80° F.). The tree may be useful for grafting. Maru name *she-ham-shi.*" (*Ward.*)

49887. SACCHARUM OFFICINARUM L. Poaceæ. Sugar cane.

From Santiago de las Vegas, Cuba. Cuttings presented by Dr. Mario Calvino, director, Agricultural Experiment Station. Received April 13, 1920.

"This variety, *Uba del Natal*, is supposed to be immune to the red-stripe disease." (*B. T. Galloway.*)

49888. TRIFOLIUM PRATENSE L. Fabaceæ. Red clover.

From Valparaiso, Chile. Seeds purchased through Carl F. Deichman, American consul. Received April 13, 1920.

Chilean red clover.

49889. PINUS GERARDIANA Wall. Pinaceæ. Chilgoza pine.

From Rawalpindi, Punjab, India. Seeds presented by Dr. Ralph R. Stewart, Gordon College. Received April 14, 1920.

The Chilgoza pine is a moderate-sized tree found native in the inner dry and arid valleys of the northwestern Himalayas, generally at altitudes of 6,000 to 12,000 feet. It is quite hardy, enduring high winds and severe winters with heavy snows. The chief product of this tree is the edible seed, nearly an inch long; these are very nutritious and agreeable in flavor, forming the staple food of the natives. (Adapted from *letter of W. H. Michael, consul general, Calcutta,* and *India Forest Department Bulletin No. 7, 1906.*)

For previous introduction, see S. P. I. No. 40216.

49890. ACACIA BUXIFOLIA A. Cunn. Mimosaceæ.

From Tangier, Morocco. Seeds presented by M. Jules Goffart. Received April 14, 1920.

An Australian shrub, 4 feet in height, with angular branchlets and small, rather thick phyllodia. The short racemes, scarcely longer than the phyllodia, bear globular heads of flowers. (Adapted from *Bentham, Flora Australiensis, vol. 2, p. 372.*)

For previous introduction, see S. P. I. No. 47366.

49891 to 49894.

From Sydney, New South Wales, Australia. Seeds presented by the Forestry Commission, New South Wales, through George Valder, Director of Agriculture. Received April 15, 1920. Quoted notes by Mr. Valder.

49891. ATALAYA HEMIGLAUCA F. Muell. Sapindaceæ.

"*Whitewood.*"

One of the inland fodder trees which favorably attracted the attention of stock owners in the early days of the pastoral occupation of New South Wales. The tree attains a height of 30 feet and has large compound whitish leaves with leaflets sometimes 8 inches long but usually smaller. The numerous terminal clusters of flowers are succeeded by winged fruits. From the trunk exudes a gum which sometimes accumulates in masses weighing more than half a pound. When grass and other herbage fails the leaves are taken from the tree and fed to cattle, for which it makes a good feed. (Adapted from *The Pastoral Finance Association Magazine, vol. 5, No. 18, p. 33.*)

49892. GEIJERA PARVIFLORA Lindl. Rutaceæ.

"*Wilga.* From Nyngan, New South Wales."

A tall shrub or tree, native to the interior of New South Wales, where it reaches a height of about 30 feet. It has slender, pendulous branches and narrow leaves 3 to 6 inches long, and a well-developed specimen has a highly ornamental appearance, having something of the aspect of a weeping willow. It has remarkable drought-enduring qualities, and the leaves are often fed to sheep, which are very fond of them. (Adapted from *The Pastoral Finance Association Magazine, vol. 5, No. 18, p. 132.*)

49893. MIDA ACUMINATA (R. Br.) Kuntze Santalaceæ. **Quandong.**
(*Fusanus acuminatus* R. Br.)

The quandong, sometimes called "native peach," is a tree 20 to 30 feet high and is found in the hotter and drier parts of New South Wales. Its drought-enduring qualities are wonderful, for its growth seems to be affected neither by drought nor by the hot winds which periodically blow over the interior. The leaves are much relished by sheep and cattle, and the red fruits, up to 3 inches in circumference, are much valued for the edible succulent outer parts which are used for preserves, resembling the guava in flavor. The kernels are also edible and contain a large percentage of oil which when burned gives a good light. (Adapted from *The Pastoral Finance Association Magazine, vol. 5, No. 18, p. 33.*)

For previous introduction, see S. P. I. No. 43423.

49894. OWENIA ACIDULA F. Muell. Meliaceæ.

The *gruie*, or *sour plum*, is a highly ornamental, umbrageous tree, native to New South Wales, where it grows to be about 25 feet in height. It is regarded as a good fodder tree, as stock are very fond of its leaves. The ripe fruit is 3 to 4 inches in circumference, rich crimson, and the succulent outer portion is rather acidulous in flavor. The stone is exceedingly hard, and the tree is very hard to propagate by ordinary methods. (Adapted from *The Pastoral Finance Association Magazine, vol. 5, No. 18, p. 33.*)

49895 to 49897. ANANAS SATIVUS Schult. f. Bromeliaceæ. **Pineapple.**

From Singapore, Straits Settlements. Suckers presented by the acting director of the Botanic Gardens. Received April 15, 1920.

49895. *Ruby.*

49896. *Mauritius.*

49897. *Sarawak.*

49898. LINUM NARBONENSE L. Linaceæ. **Flax.**

From Verrieres, France. Seed presented by Jacques de Vilmorin. Received April 17, 1920.

A most desirable plant from southern Europe, with linear leaves and a graceful drooping habit; it is 2½ feet across and 18 inches high. The flowers, which appear throughout the summer, are arranged in a loose panicle, with long pedicels. Each flower is 1½ inches across, bright azure-blue, somewhat paler beneath, with white anthers and a white spot in the center of each flower. (Adapted from *The Garden, vol. 52, p. 401.*)

49899 to 49902. CYAMOPSIS TETRAGONOLOBA (L.) Taub. Fabaceæ. (*C. psoraloides* DC.) **Guar.**

From Poona, Bombay Presidency, India. Seeds presented by A. A. Vasavada, Agricultural Branch. Received April 19, 1920.

"An erect East Indian leguminous annual, with long, straight stems bearing an enormous number of pods, each containing about seven pale, angular seeds. The plant grows 3 to 6 feet in height; in India it is cultivated both for green forage and for the seed, which is used mainly for feeding cattle and also as human food. Guar may be grown anywhere in the country where cowpeas succeed and is more drought resistant than any other annual legume. It may be utilized as hay, pasturage, or as silage." (*C. V. Piper.*)

49899. *Gawar Makhnisa.*

49900. *Gawar Pardeshi.*

49901. *Gawar Satia.*

49902. Local *Gawar.*

For previous introduction, see S. P. I. No. 43503.

49903 and 49904. CYAMOPSIS TETRAGONOLOBA (L.) Taub. Fabaceæ. (*C. psoraloides* DC.) **Guar.**

From Nagpur, Central Provinces, India. Seeds presented by K. P. Shrivastava, officiating economic botanist. Received April 19, 1920. Quoted notes by Mr. Shrivastava.

"I am sending seeds of the following two varieties, which are cultivated generally around Nagpur; both are generally grown during the rainy season."

49903. "*Telia Guar Phali.*"

49904. "*Deshi Guar Phali.*"

For previous introduction, see S. P. I. No. 49900.

49905 to 49910.

From Peking, Chihli, China. Presented by N. H. Cowdry, Peking Union Medical College. Received April 21, 1920. Quoted notes by Mr. Cowdry.

49905. CLEMATIS sp. Ranunculaceæ. **Clematis.**

"Seed of an upright species."

49906. DIOSPYROS LOTUS L. Diospyraceæ.

"Fruits which are very commonly sold in Peking."

For previous introduction, see S. P. I. No. 44688.

49905 to 49910—Continued.

49907. IRIS DICHOTOMA Pall. Iridaceæ. **Iris.**

"Seed of a handsome solitary plant, flowering in August."

49908. IRIS sp. Iridaceæ. **Iris.**

"Seed of a beautiful early spring flower."

49909. SCABIOSA sp. Dipsacaceæ.

"*Admiral Wo.* Seeds given to me by a Chinese friend, who says the flowers are large and blue. Growing only in one locality."

49910. ZIZIPHUS JUJUBA Mill. Rhamnaceæ. **Jujube.**
(*Z. sativa* Gaertn.)

"Fruits of the Chinese date. A very common tree in gardens."

For previous introduction, see S. P. I. No. 44687.

49911 to 49921.

From Techow, Shantung, China. Seeds presented by Miss Alice Reed through Prof. Henry Conrad, Grinnell College, Grinnell, Iowa. Received April 21, 1920. Quoted notes by Miss Reed.

49911. ALLIUM CEPA L. Liliaceæ. **Onion.**

"*Ts'ung* onions. Plant in early summer or at any time."

49912. APIUM GRAVEOLENS L. Apiaceæ. **Celery.**

"*Chinese* celery. Plant in spring."

49913. BETA VULGARIS L. Chenopodiaceæ. **Beet.**

"*Ken tang ts'ai.* Plant in spring."

49914 and **44915.** BRASSICA PEKINENSIS (Lour.) Gagn. Brassicaceæ. **Pai ts'ai.**

49914. "*Ta pai ts'ai.* Mammoth cabbage. Plant in summer; matures in late autumn for winter use."

49915. "*Pai ts'ai.* Spring cabbage. Plant in spring."

49916. DAUCUS CAROTA L. Apiaceæ. **Carrot.**

"*Hung do Pei.* Plant in early summer."

49917. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean.**

"Small green bean."

49918 to 49920. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

49918. "Black bean." **49920.** "Large green bean."

49919. "Yellow bean."

49921. SPINACIA OLERACEA L. Chenopodiaceæ. **Spinach.**

"*Po ts'ai.*"

49922 to 49954.

From Kew, England. Seeds presented by Sir David Prain, director, Royal Botanic Gardens. Received April 24, 1920.

49922. ANEMONE SYLVESTRIS L. Ranunculaceæ.

A European plant commonly called snowdrop anemone because of the drooping habit of the flowers before fully expanding, giving it a certain resemblance to the snowdrop (*Galanthus nivalis*). The white flowers, 1½ inches in diameter, are borne on long peduncles which arise singly from an involucre of leaves. These leaves are ternate or quinate with deeply toothed leaflets and are hairy on the undersurface. (Adapted from *The Garden, vol. 65, p. 73.*)

49922 to 49954—Continued.

49923. ANEMONE VITIFOLIA Buch.-Ham. Ranunculaceæ.

An ornamental plant, 1½ to 3 feet high, with white flowers. Common in Nepal.

For previous introduction, see S. P. I. No. 47693.

49924. BERBERIS ANGULOSA Wall. Berberidaceæ. **Barberry.**

A deciduous shrub from India, 4 feet or more high, with dark glossy green leaves, orange-yellow flowers, two-thirds of an inch across, and scarlet fruits.

49925. BERBERIS BEANIANA C. Schneid. Berberidaceæ. **Barberry.**

A shrub with vigorous shoots, yellow spines, small yellow flowers, and purple plum-shaped fruits. (Adapted from *Sargent, Plantae Wilsonianae, vol. 3, p. 439.*)

49926. BERBERIS CONCINNA Hook. f. Berberidaceæ. **Barberry.**

A low bush of compact habit with lustrous green leaves white beneath, deep-yellow flowers, and red berries. Native to the Sikkim Himalayas.

For previous introduction, see S. P. I. No. 40145.

49927. BERBERIS DUBIA C. Schneid. Berberidaceæ. **Barberry.**

A Chinese shrub with ovate leaves paler beneath and with flowers in short racemes. (Adapted from *Bulletin de l'Herbier Boissier, second series, vol. 5, p. 663.*)

49928. BERBERIS LYCIUM Royle. Berberidaceæ. **Barberry.**

A Himalayan plant that yields the Indian "rasout," an extract from the root used to allay inflammation of the eyes; also employed by the natives in the treatment of fevers of all kinds. The beautiful purple fruit is covered with a delicate bloom, is edible, and is dried and exported. (Adapted from *Curtis's Botanical Magazine, pl. 7075.*)

For previous introduction, see S. P. I. No. 30769.

49929. BERBERIS AGGREGATA PRATTII C. Schneid. Berberidaceæ. **Barberry.**

A western Chinese shrub, 6 to 10 feet high, with yellow flowers in narrow panicles and ovoid salmon-red fruits.

For previous introduction, see S. P. I. No. 44527.

49930. BERBERIS SOULIEANA C. Schneid. Berberidaceæ. **Barberry.**

A plant with very firm leaves having rather spreading spinose teeth and distinctly glaucous globose fruits. (Adapted from *Sargent, Plantae Wilsonianae, vol. 3, p. 437.*)

For previous introduction, see S. P. I. No. 40682.

49931. BERBERIS THIBETICA C. Schneid. Berberidaceæ. **Barberry.**

A red-fruited bush, 1½ to 2 meters high, found in thickets at an altitude of 3,200 to 3,400 meters in western Szechwan.

49932. BERBERIS UMBELLATA Wall. Berberidaceæ. **Barberry.**

An erect straggling Himalayan shrub, 8 to 10 feet high, with oblong berries.

For previous introduction, see S. P. I. No. 33023.

49933. BERBERIS HOOKERI Lem. Berberidaceæ. **Barberry.**
(*B. wallichiana* Hook., not DC.)

A yellow-flowered shrub, native to forests at altitudes of 8,000 to 10,000 feet in the temperate portions of the Himalayas. It has evergreen lanceolate leaves and blackish purple, shining berries. (Adapted from *Hooker, Flora of British India, vol. 1, p. 110.*)

For previous introduction, see S. P. I. No. 44381.

49922 to 49954—Continued.

49934. CLEMATIS AETHUSIFOLIA Turcz. Ranunculaceæ.

A free-growing deciduous climber from China, 5 to 6 feet high, with densely tangled slender stems and finely divided foliage. The attractive pale-yellow blossoms are produced profusely.

49935. CLEMATIS FARGESII Franch. Ranunculaceæ.

A 20-foot climber with white flowers which are 2 inches across in 3-flowered long-stalked axillary cymes.

49936. CLEMATIS FUSCA Turcz. Ranunculaceæ.

A semiherbaceous climber from northeastern Asia, with woolly reddish brown pitcher-shaped flowers. The seed vessels are covered with yellow-brown silky hairs.

49937. CLEMATIS REHDERIANA Craib. Ranunculaceæ.

A Chinese woody climber with pinnate chartaceous leaves which are pale beneath and compact axillary panicles of flowers. The sepals are 1.7 centimeters long, reflexed at the tip, pilose on the outer surface, smooth on the inner. (Adapted from *Kew Bulletin of Miscellaneous Information, 1914, p. 150.*)

49938. CLEMATIS VEITCHIANA Craib. Ranunculaceæ.

A Chinese woody climber with bipinnate chartaceous leaves and long lax axillary inflorescences of gracefully drooping flowers with ciliated sepals. (Adapted from *Kew Bulletin of Miscellaneous Information, 1914, p. 151.*)

49939. DEUTZIA CORYMBOSA R. Br. Hydrangeaceæ.

This pretty species has a special value by reason of its late, continuous flowering, being at its best in July and August, when the bush is covered with the corymbose clusters of pure-white flowers not far removed in form or purity of color from those of *Bouvardia jasminoides*. (Adapted from *Gardening Illustrated, vol. 39, p. 501.*)

49940. DEUTZIA LONGIFOLIA Franch. Hydrangeaceæ.

A deciduous shrub, 4 to 6 feet high, one of the handsomest garden plants of the genus. The young shoots are covered with a pale scurf and the leaves are whitish below. The rosy flowers, about an inch across, are borne in rounded cymose clusters 2 to 3 inches across. (Adapted from *Gardeners' Chronicle, third series, vol. 51, p. 409.*)

For previous introduction, see S. P. I. No. 42691.

49941. DEUTZIA LONGIFOLIA VEITCHII (Veitch) Rehder. Hydrangeaceæ.

This vigorous plant from Yunnan, China, has large, brilliantly colored, deep rose-lilac flowers, disposed in numerous little clusters the entire length of the branches.

For previous introduction, see S. P. I. No. 42691.

49942. DEUTZIA MOLLIS Duthie. Hydrangeaceæ.

A very distinct and beautiful species from central China. The white or pink-tinged flowers are in flat corymbose panicles. (Adapted from *Gardeners' Chronicle, third series, vol. 40, p. 238.*)

49943. DEUTZIA SIEBOLDIANA Maxim. Hydrangeaceæ.

The lowest growing of all the Deutzias, of a very compact habit. It has small white flower panicles which are not very conspicuous; but it is a very graceful shrub. (Adapted from *Gardening Illustrated, vol. 39, p. 335.*)

49922 to 49954—Continued.

49944. DEUTZIA VILMORINAE Lemoine and Bois. Hydrangeaceæ.

A plant of vigorous growth with pure-white flowers, suggestive of some of the smaller growing kinds of Philadelphus, a resemblance which is increased by the lateness of its flowering period. It is a native of China. M. Lemoine, of Nancy, has raised hybrids between this species and different forms of *Deutzia crenata* or *D. scabra*, which flower at about the same time and thus usually escape injury from late spring frosts which often damage the flowers of the earlier kinds. As the parents of these are among the most desirable of our early-flowering shrubs and valuable from the fact that many spring-flowering subjects are over before their blossoms develop, these newer hybrids should prove good acquisitions. (Adapted from *Gardening Illustrated, vol. 39, p. 362.*)

For previous introduction, see S. P. I. No. 35184.

49945. DIERVILLA SESSILIFOLIA Buckl. Caprifoliaceæ.

A beautiful free-flowering North American plant with light pea-green leaves 8 inches long and 3 to 4 inches broad and pretty sweet-scented light-yellow flowers. (Adapted from *Gardeners' Chronicle, third series, vol. 42, p. 427.*)

49946. DEUTZIA WILSONI Duthie. Hydrangeaceæ.

A very handsome Chinese shrub with reddish brown bark, soon peeling, and scabrous oblanceolate leaves 3 to 4½ inches long. The white flowers, nearly 1 inch across, are in open corymbs; the petal margins are wavy and hooded. (Adapted from *Curtis's Botanical Magazine, pl. 8083.*)

49947. LONICERA ALPIGENA L. Caprifoliaceæ. **Honeysuckle.**

A central European deciduous shrub, 4 to 8 feet high, with paired red-tinged yellow flowers on long stalks and red cherrylike fruits.

49948. PHILADELPHUS ACUMINATUS Lange. Hydrangeaceæ.

A Chinese shrub 10 feet high, with hard-tipped serrate leaves and very fragrant white flowers.

49949. PHILADELPHUS LEWISII Pursh. Hydrangeaceæ.

One of the most floriferous of all the taller species, with graceful pendulous branches. The white flowers are more than an inch across. Native to western North America.

49950. PHILADELPHUS PEKINENSIS Rupr. Hydrangeaceæ.

A free-flowering Chinese shrub with slightly fragrant yellowish flowers about 1 inch across, produced in racemes of five to nine.

49951. ROSA GLUTINOSA Sibth. and Smith. Rosaceæ. **Rose.**

A dwarf sweetbrier, ranging from Italy eastward to Persia, with short compact branches and white flowers tinged with pink. The small globose fruits are bright red. (Adapted from *Willmott, The Genus Rosa, pl. 150.*)

49952. ROSA MOLLIS J. E. Smith. Rosaceæ. **Rose**

A compact rose, often not more than 3 feet high, with short erect stems and broadly oval leaflets clothed with soft-gray pubescence on both surfaces. The flowers are usually pink, occasionally white, and the early ripening red pulpy fruits with erect persistent sepals are often pendulous and very ornamental. (Adapted from *Willmott, The Genus Rosa, pl. 138.*)

49953. ROSA SERAFINII Viv. Rosaceæ. **Rose.**

A dwarf, densely branching leafy bush with dark-green leaves and solitary bright rose-colored flowers. The pea-shaped fruits are red changing to black. Native to Corsica, Sardinia, Sicily, and the Apuan and Maritime Alps. (Adapted from *Curtis's Botanical Magazine, pl. 7761.*)

For previous introduction, see S. P. I. No. 32961.

49922 to 49954—Continued.

49954. ROSA WEBBIANA Wall. Rosaceæ. **Rose.**

A rose common in the central Himalayas, at altitudes of 6,000 to 13,000 feet. The great beauty of this rose lies in the young shoots which at first are absolutely blue and covered with large pure-white thorns. It has the smallest leaves of any cultivated rose. The flowers are pink, moderately large, and the globose coriaceous fruit is nodding. (Adapted from *Willmott, The Genus Rosa, pl. 76.*)

For previous introduction, see S. P. I. No. 40191.

49955 to 49976.

From Africa. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received April 5, 1920. Quoted notes by Doctor Shantz.

49955. ADENANTHERA PAVONINA L. Mimosaceæ. **Coral-bean tree.**

"(No. 384. Elizabethville, Belgian Kongo. December 29, 1919.) A leguminous tree with bright-red beans, used as a street tree in Elizabethville."

For previous introduction, see S. P. I. No. 42355.

49956. ALBIZZIA LEBBECK (L.) Benth. Mimosaceæ. **Lebbeck tree.**

"(No. 379. Elizabethville, Belgian Kongo. December 28, 1919.) An attractive tree for ornamental purposes or as a street tree."

For previous introduction, see S. P. I. No. 42809.

49957. ASPARAGUS sp. Convallariaceæ.

"(No. 374. Victoria Falls, Southern Rhodesia. November 17, 1919.) A large spiny type."

49958. BERLINIA sp. Cæsalpiniaceæ.

"(No. 375. Victoria Falls, Southern Rhodesia. November 17, 1919.) Seeds of a leguminous tree."

49959. BIDENS PILOSA L. Asteraceæ.

"(No. 378. Elizabethville, Belgian Kongo. December 28, 1919.) A very common plant in this part of the Kongo; it makes a splendid forage plant, but has weedy tendencies. [It is the same as No. 188, S. P. I. No. 49292.]"

49960. BRACHYSTEGIA sp. Cæsalpiniaceæ.

"(No. 377. Victoria Falls, Southern Rhodesia. November 17, 1919.) A leguminous tree."

49961. CASSIA DIDYMOBOTRYA Fres. Cæsalpiniaceæ.

"(No. 380. Elizabethville, Belgian Kongo. December 28, 1919.) A sennalike ornamental shrub; good for parking."

For previous introduction, see S. P. I. No. 43649.

49962. COFFEA EXCELSA Cheval. Rubiaceæ. **Coffee.**

"(No. 369. Elizabethville, Belgian Kongo. December 27, 1919.) Said to be a native coffee; obtained from M. De Neuter, Elizabethville."

49963. COFFEA LAURENTII Wildem. Rubiaceæ. **Coffee.**
(*C. robusta* Hort.)

"(No. 368. Elizabethville, Belgian Kongo. December 27, 1919.) One of the best types for the Kongo; said to be a native coffee. Secured from M. De Neuter at Elizabethville."

For previous introduction, see S. P. I. No. 32359.

49955 to 49976—Continued.

49964. COMBRETUM sp. Combretaceæ.

"(No. 382a. Elizabethville, Belgian Kongo. December 29, 1919.) One of the prominent trees of this section; often large."

49965. CYPHOMANDRA BETACEA (Cav.) Sendt. Solanaceæ. **Tree-tomato.**

"(No. 382. Elizabethville, Belgian Kongo. December 29, 1919.) This plant does well here in cultivation and produces quantities of egg-shaped fruits. It grows rapidly and lives about four years."

For previous introduction, see S. P. I. No. 44913.

49966. ELEUSINE CORACANA (L.) Gaertn. Poaceæ. **Ragi millet.**

"(No. 359. Sakania, Belgian Kongo. December 17, 1919.) Said to be especially prized for making Kafir beer; grown only by the natives."

For previous introduction, see S. P. I. No. 46295.

49967 and **49968.** HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

49967. "(No. 358 Sakania, Belgian Kongo. December 17, 1919.) The type grown by natives of this section. I have seen fields broadcast, but as a rule it is grown in hills like corn."

49968. "(No. 365a. Elizabethville, Belgian Kongo. December 27, 1919.) A white kafir grown by the natives and one of the chief food staples. The seed looks quite uniform and much like our white-hulled kafir. Grown at Munama Experiment Station."

49969 and 49970. ORYZA SATIVA L. Poaceæ. **Rice.**

49969. "(No. 366. Elizabethville, Belgian Kongo. December 27, 1919.) A late variety grown without irrigation by the natives at Stanleyville, known to the natives as *kinyeki*. The grain breaks up easier and it is three weeks later than No. 367 [S. P. I. No. 49970]. Obtained from M. De Neuter, Chef du Service de l'Agriculture, Elizabethville."

49970. "(No. 367. Elizabethville, Belgian Kongo. December 27, 1919.) An early rice known as *mutsclu* by the natives who grew it at Stanleyville. It is grown with rain only or as dry-land rice; no irrigation. It is three or four weeks earlier than No. 366 [S. P. I. No. 49969]. Obtained from M. De Neuter, Elizabethville."

49971. PLECTRONIA sp. Rubiaceæ.

"(No. 385. Elizabethville, Belgian Kongo. December 29, 1919. Herb. No. 500.) A low shrubby plant with white or greenish flowers and black berries."

49972. SOLANUM sp. Solanaceæ.

"(No. 371. Elizabethville, Belgian Kongo. December 27, 1919.) A decorative Solanum, with deep-lavender flowers 1½ inches wide and deep-orange fruits 1½ inches in diameter."

49973. TRISTACHYA BISERIATA Stapf. Poaceæ. **Grass.**

"(No. 381. Elizabethville, Belgian Kongo. December 29, 1919. Herb. No. 502.) One of the taller, coarser grasses. It has three awns like an Aristida, but two of these are very small. All grasses of this section grow on a continuous grass floor under the tall spreading forest trees. They should be tried in the Southern States. Drought obtains here from July to November, inclusive, with rain the rest of the year."

For previous introduction, see S. P. I. No. 23923.

49955 to 49976—Continued.

49974. ZEA MAYS L. Poaceæ. **Corn.**

"(No. 357. Sakania, Belgian Kongo. December 17, 1919.) The corn grown by the natives of this section; said to be small and early. It is planted mostly in small elevated beds about the native villages. Meal from this corn constitutes the chief food of the natives. This is a cool part of the Kongo, and the corn is probably an earlier type than will be found farther down."

49975. (Undetermined.)

"(No. 376. Victoria Falls, Southern Rhodesia. November 17, 1919.) Seeds of a medium-sized forest tree from the open forests of Zambesi region."

49976. (Undetermined.)

"(No. 383. Elizabethville, Belgian Kongo. December 29, 1919.) A tree which bears a large quantity of small, orange fruits with tough rinds and large pulp-covered seeds. The fruit is said to be eaten by the natives, but it does not taste very good and there is very little edible material on each fruit."

49977 to 50054.

From Belgian Kongo. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received April 6, 1920. Quoted notes by Doctor Shantz.

49977. ABELMOSCHUS ESCULENTUS (L.) Moench. Malvaceæ. **Okra.**
(*Hibiscus esculentus* L.)

"(No. 439. Bukama. January 16, 1920.) A tall okra plant with unusually short fruits which are used extensively. It is but rarely seen here and differs only slightly from the plant in our own gardens."

49978 and 49979. ANNONA MURICATA L. Annonaceæ. **Soursop.**

49978. "(No. 511. Kindu. January 27, 1920.) An introduced fruit, 6 inches long, with white flesh of very good flavor."

For previous introduction, see S. P. I. No. 47874.

49979. "(No. 527. Kongolo. February 1, 1920.) A large and unusually good soursop. It is grown both here and at Kindu."

49980. ANNONA RETICULATA L. Annonaceæ. **Custard-apple.**

"(No. 528. Kongolo. February 2, 1920. A very good custard-apple; quite abundant here and said to produce fruit in three years from seed."

For previous introduction, see S. P. I. No. 45955.

49981. ARACHIS HYPOGAEA L. Fabaceæ. **Peanut.**

"(No. 467. Moyumba. January 20, 1920.) A variety of peanut grown by the natives; an important food crop."

49982. ASPARAGUS sp. Convallariaceæ. **Asparagus.**

"(No. 402. Kalule Sud. January 8, 1920.) An upright, rather spiny asparagus; a bush and not a vine. Valuable as an ornamental."

49983. BOTHRIOCLINE sp. Asteraceæ.

"(No. 401. Kalule Sud. January 8, 1920. Herb. No. 546.) A rather large-flowered plant which resembles Vernonia."

49984. BRACHIARIA BRIZANTHA (Hochst.) Stapf. Poaceæ. **Grass.**
(*Panicum brizanthum* Hochst.)

"(No. 404. Kalule Sud. January 8, 1920. Herb. No. 535.) A tall hairy leaved Chaetochloalike grass forming large clumps, with a luxuriant growth."

For previous introduction, see S. P. I. No. 43240.

49977 to 50054—Continued.

49985. CAESALPINIA PULCHERRIMA (L.) Swartz. Cæsalpiniaceæ.

"Seeds of this shrub or small tree were found with corn from Nionga, collected January 18, 1920. The plant is a leguminous ornamental widely distributed throughout the Tropics and has large open clusters of flowers whose petals are scarlet edged with gold."

49986. CAJAN INDICUM Spreng. Fabaceæ. **Pigeon-pea.**

"(No. 531. Kongolo. February 2, 1920.) A tall woody legume called a bean by the whites and said to be very good while still green."

49987. CANAVALI ENSIFORME (L.) DC. Fabaceæ. **Jack bean.**

"(No. 521. Kindu. January 28, 1920.) A large white bean grown by the natives and used in soups."

49988. CAPSICUM ANNUUM L. Solanaceæ. **Red pepper.**

"(No. 444. Nionga. January 28, 1920.) A variety of paprika with very narrow leaves and spreading habit; it is grown by the natives."

49989. CASSIA ALATA L. Cæsalpiniaceæ.

"(No. 526. Kongolo. February 1, 1920. Herb. No. 633.) A Cassia which forms an attractive shrub."

49990. CASSIA OCCIDENTALIS L. Cæsalpiniaceæ.

"(No. 449. Kadia. January 18, 1920. Herb. No. 593.) A yellow-flowered legume abundant on moist soil. It may be a good green manure for southern wet lands. A native told me the leaves were used as greens."

For previous introduction, see S. P. I. No. 42830.

49991. CASSIA sp. Cæsalpiniaceæ.

"(No. 400. Elizabethville. January 6, 1920.) A small bush used as an ornamental at Elizabethville."

49992. CHAETOCHLOA sp. Poaceæ. **Grass.**

"(No. 440. Kebelwe. January 17, 1920. Herb. No. 588.) A tall grass from moist soil near the river, where it grows up singly, not forming clumps."

49993. CLEOME sp. Capparidaceæ.

"(No. 474. Ankoro. January 21, 1920.) An attractive ornamental with pink flowers."

49994. COMBRETUM sp. Combretaceæ.

"(No. 514. Kindu. January 28, 1920. Herb. No. 630.) A shrub or vine with yellow flowers and the leaves of the flowering branches bright red."

49995. CRACCA sp. Fabaceæ.

"(No. 464. Kabwe. January 19, 1920. Herb. No. 598.) Seeds of a large velvet bean."

49996. CRACCA sp. Fabaceæ.

"(No. 469. Kayombe. January 20, 1920. Herb. No. 601.) Seeds of a pink legume; may be valuable as forage or for green manure."

49997. CUCURBITA PEPO L. Cucurbitaceæ. **Pumpkin.**

"(No. 455. Kadia. January 18, 1920.) Seeds of a pumpkin grown by the natives."

49998. DRACAENA sp. Liliaceæ.

"(No. 510. Kindu. January 27, 1920.) An attractive plant somewhat like Pandanus but with equally arranged leaves and red palmlike fruits."

49977 to 50054—Continued.

49999. ECHINOCHLOA PYRAMIDALIS (Lam.) Hitchc. and Chase. Poaceæ. (*Panicum pyramidalis* Lam.) **Grass.**

"(No. 473. Kapako, near Ankoro. January 21, 1920. Herb. No. 594.) A tall grass common along the river."

50000. ELAEIS GUINEENSIS Jacq. Phœnicaceæ. **Oil palm.**

"(No. 442. Nionga. January 18, 1920.) The most important palm of the Kongo. The pulp is eaten raw or roasted; also the oil is extracted from the pulp and from the kernel. It is abundant along the Lualaba south as far as the vicinity of Bukama. It is planted everywhere by the natives, and the tree always belongs to the man who planted it or to his descendants. It forms a fringe along the banks of the Lualaba. At Kindu and Kongolo there are trees, but it seems far less important here than farther south."

For previous introduction, see S. P. I. No. 48010.

50001. ELEUSINE CORACANA (L). Gaertn. Poaceæ. **Ragi millet.**

"(No. 446. Kadia. January 18, 1920.) Called 'millet'; a short, low-growing plant known in Luban as *luku*. It is the most important seed for the manufacture of beer; also used as a food."

For previous introduction, see S. P. I. No. 46295.

50002. ERIOSEMA sp. Fabaceæ.

"(No. 466. Moyumba. January 20, 1920. Herb. No. 599.) A leguminous shrub abundant on the river lands."

50003. ETHULIA CONYZOIDES L. Asteraceæ.

"(No. 450. Kadia. January 18, 1920. Herb. No. 592.) A lavender-flowered composite; this may be valuable as an ornamental."

50004. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"(No. 529. Kongolo. February 2, 1920.) A cotton with a very long pod, secured from the Catholic Mission."

50005. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"(No. 535. Kongolo. February 3, 1920. Herb. No. 643.) Seeds of a black-seeded, long-podded native cotton, probably the same as No. 533 [S. P. I. No. 50006]. The plants were growing wild around Kongolo and are believed by the whites to be native cotton. This particular one has fairly good lint."

50006. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"(No. 533. Kongolo. February 2, 1920.) Cotton picked up at a trader's store; apparently secured from the natives."

50007. HIBISCUS sp. Malvaceæ.

"(No. 452. Kadia. January 18, 1920. Herb. No. 591.) An ornamental plant about 4 feet high, with lemon-yellow flowers marked with rich purple."

50008 and 50009. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc. Poaceæ. **Tabucki grass.**

50008. "(No. 441. Nionga, west of Lake Kisali. January 17, 1920. Herb. No. 589.) Mixed seeds from plants growing near the village; abundant along the Lualaba River."

50009. "(No. 454. Kadia. January 18, 1920.)"

50010 and 50011. HOLCUS SORGHUM EFFUSUS (Hack.) Hitchc. Poaceæ. **Kamerun grass.**

50010. "(No. 460. Mulongo. January 19, 1920. Herb. No. 496.) Seeds of a tall plant on the uplands."

50011. "(No. 461. January 19, 1920.) Similar to No. 460 [S. P. I. No. 50010]."

49977 to 50054—Continued.

50012 to 50014. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc. Poaceæ. **Tabucki grass.**

50012. "(No. 483. Malele. January 23, 1920. Herb. No. 610.) Seeds of a plant growing at the side of the track."

50013. "(No. 506. Kindu. January 27, 1920. Herb. No. 623.) Seeds from a plant on low land."

50014. "(No. 507. Kindu. January 27, 1920.) Seeds from a plant on the uplands."

50015. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

"(No. 516. Kindu. January 28, 1920.) Seeds of a grass very abundant here but never used by the natives."

50016. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc. Poaceæ. **Tabucki grass.**

"(No. 524. Kongola. January 31, 1920.) Seeds."

50017 to 50019. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

50017. "(No. 387. Elizabethville. January 5, 1920.) White kafir."

50018. "(No. 445. Kadia. January 18, 1920.) Red kafir, known in the Luban language as *muki;* important for food."

50019. "(No. 530. Kongolo. February 2, 1920.) A white kafir grown east and south of here; called *mutama* by the natives."

50020. INULA sp. Asteraceæ.

"(No. 404. Kalule Sud. January 8, 1920.) An ornamental composite."

50021. JATROPHA CURCAS L. Euphorbiaceæ.

"(No. 459. Kulu. January 19, 1920.) A hedge plant with cottonlike leaves and upright habit. The fruits are yellow-green and three-fourths of an inch in diameter. The seed yields an oil."

For previous introduction, see S. P. I. No. 47916.

50022. KIGELIA sp. Bignoniaceæ.

"(No. 539. Kongolo. February 3, 1920.) The large sausage tree; abundant from the Zambezi to Kongolo."

50023. LUFFA CYLINDRICA (L.) Roem. Cucurbitaceæ.
(*L. aegyptiaca* Mill.)

"(No. 538. Kongolo. February 3, 1920. Herb. No. 642.) A variety of Luffa which grows wild here; not eaten by the natives."

For previous introduction, see S. P. I. No. 40533.

50024. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

"(No. 463. Kabwe. January 19, 1920.) A small red tomato planted everywhere by the natives."

50025. MELOTHRIA sp. Cucurbitaceæ.

"(No. 409. Kalule Sud. January 19, 1920.) A small cucurbit with pointed, very pretty fruits; said to be eaten by the natives. The plant is a low climber or prostrate."

50026. MELOTHRIA sp. Cucurbitaceæ.

"(No. 457. Kadia. January 18, 1920.) A small red fruit, one-fourth of an inch in diameter; ornamental."

49977 to 50054—Continued.

50027. PHYSALIS PERUVIANA L. Solanaceæ. **Poha.**

"(No. 410. Kalule Sud. January 19, 1920.) The Cape gooseberry, which grows along the track."

For previous introduction, see S. P. I. No. 46681.

50028. PROTEA sp. Proteaceæ.

"(No. 406. Kalule Sud. January 8, 1920. Herb. No. 545.) A red shrub about a foot high."

50029. RICINODENDRON RAUTANENII Schinz. Euphorbiaceæ. **Manketti tree.**

"(No. 534. Kongolo. February 3, 1920. Herb. No. 417.) A timber and nut tree."

For an illustration of the manketti tree, see Plate III.

50030 and 50031. RICINUS COMMUNIS L. Euphorbiaceæ. **Castor-bean.**

50030. "(No. 451. Kadia. January 18, 1920.) Castor-oil beans."

50031. "(No. 532. Kongolo. February 2, 1920.)"

50032. SAPINDUS SENEGALENSIS Poir. Sapindaceæ. **Soapberry.**

"(No. 525. Kongolo. January 31, 1920.) Seeds of a tree whose fruits are used as a substitute for soap."

50033. SESAMUM ORIENTALE L. Pedaliaceæ. **Sesame.**

"(No. 512. Kindu. January 28, 1920.) Seeds of sesame grown by natives for its oil."

50034. SESAMUM ANGOLENSE Welw. Pedaliaceæ. **Sesame.**

"(No. 475. Below Kambi. January 21, 1920. Herb. No. 600.) Seeds of a sesame, abundant all along the river; this is a wild form with a larger flower than the cultivated kind."

50035. SOLANUM MELONGENA L. Solanaceæ. **Eggplant.**

"(No. 399. Elizabethville. January 6, 1920.) A red eggplant, very small but sold when still green; secured from the native market."

50036. SOLANUM sp. Solanaceæ.

"(No. 403. Kalule Sud. January 8, 1920. Herb. No. 533.) A small orange-fruited Solanum with berries half an inch in diameter. The plant is about 3 feet high and makes a fairly good ornamental."

50037. SPOROBOLUS PYRAMIDALIS Beauv. Poaceæ. **Grass.**

"(No. 519. Kindu. January 28, 1920. Herb. No. 631.) A species of Sporobolus grown on poor land."

50038. TRICHOLAENA ROSEA Nees. Poaceæ. **Natal grass.**

"(No. 536. Kongolo. February 3, 1920.) This seems a taller and much more branched grass here than farther south."

For previous introduction, see S. P. I. No. 41921.

Plate IV shows this grass as it grows near Lake Tanganyika.

50039. TRICHOPTERYX DIANDRA Schum. Poaceæ. **Grass.**

"(No. 470. Kayombe. January 20, 1920. Herb. No. 603.) A grass resembling Stipa, about 8 feet high, with a loose head."

50040. TRIUMFETTA RHOMBOIDEA Jacq. Tiliaceæ.

"(No. 513. Kindu. January 28, 1920. Herb. No. 629.) A tall woody plant, 6 to 12 feet high, extensively used for fiber. It is one of the best; the fiber is very strong and easily obtained."



THE MANKETTI TREE OF THE BELGIAN KONGO. (RICINODENDRON RAUTANENII SCHINZ; S. P. I. No. 50029.)

The fruits produced by this tree, an ally of the castor-bean, somewhat resemble almonds in character. They yield over 57 per cent of a rich yellow oil and are much prized as food by the natives. Unfortunately, they are somewhat difficult to crack because of the hard shell. The tree is ornamental, and the wood, which is very light, is used in the construction of boxes and for other purposes where light weight is a prime consideration. In this respect the manketti may well be compared to the balsa tree of Central America, whose commercial exploitation is now receiving much attention. (Photographed by Dr. H. L. Shantz, Victoria Falls, Southern Rhodesia, November 13, 1919; P36745FS.)



NATAL GRASS AS IT GROWS ON THE SHORES OF LAKE TANGANYIKA, AFRICA. (TRICHOLAENA ROSEA NEES; S. P. I. No. 50038.)

Dr. Shantz has brought in several distinct strains of Natal grass, a species which has attracted much attention for several years because of its value for hay and as a mulch crop on the sandy soils of Florida and other Gulf Coast States. Not a weed itself, because it can be killed by a single plowing, it is found useful in favorable soil to choke out weeds and grasses by its vigorous growth; at the same time it yields an average of 2½ to 3 tons of excellent hay to the acre. Double that quantity has been secured under very favorable conditions. (Photographed by Dr. H. L. Shantz Nyanza, Urundi, February 29, 1920; P37628FS.)

49977 to 50054—Continued.

50041 and 50042. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

50041. "(No. 462. Mulongo. January 19, 1920.) Kafir beans; grown on river lands by natives."

50042. "(No. 391. Elizabethville. January 5, 1920.) Beans grown by the natives around through the villages."

50043. VIGNA sp. Fabaceæ.

"(No. 456. Kadia. January 18, 1920.) Seeds of a small-podded Vigna."

50044 to 50050. ZEA MAYS L. Poaceæ. **Corn.**

50044. "(No. 390. Elizabethville. January 5, 1920.) Corn secured from the natives; grown about their villages."

50045. "(No. 443. Uionga. January 18, 1920.) Corn grown by the natives near the water level on the banks of the Lualaba."

50046. "(No. 447. Kadia. January 18, 1920.) A yellow corn grown on low land near the river."

50047. "(No. 448. Kadia. January 18, 1920.) A white and purple corn. This and No. 447 [S. P. I. No. 50046] are the staple crops of the country. They are planted in November at the beginning of the rainy season and repeated plantings made up to about January. The ripe corn is soaked, half pounded in mortars, dried, winnowed (of the pericarp), pounded to a fine meal, and made into a stiff mush. This is the staple food of all natives."

50048. "(No. 505. January 26, 1920.) A white flint corn; the type most commonly grown here; from a rice-corn field."

50049. "(No. 517. Kindu. January 28, 1920.) A white dent corn, not common here."

50050. "(No. 518. Kindu. January 28, 1920.) A white flint corn, not common here."

50051. (Undetermined.)

"(No. 509. Kindu. January 27, 1920.) A large forest tree with dry fruits a little smaller than an orange."

50052. PSEUDARTHRIA HOOKERI Wight and Arn. Fabaceæ.

"(No. 523. Malele to Kindu. January 31, 1920. Herb. No. 632.) A tall herbaceous leguminous plant which looks like a pink spirea at a distance. It is abundant in the tree savanna country and may be useful as a green manure or even as an ornamental."

50053. (Undetermined.)

"(No. 537. Mongolo. February 3, 1920. Herb. No. 644.) A river-bank tree with oval red fruits about 1¾ inches long, with edible nuts."

50054. SOLANUM MELONGENA L. Solanaceæ. **Eggplant.**

"(No. 540. Kongolo. February 5, 1920.) A yellow-fruited eggplant, said to be native; of very good quality."

50055 and 50056.

From Belgian Kongo. Collected by Dr. H. L. Shantz, Agricultural Explorer of the Bureau of Plant Industry. Received April 5, 1920. Quoted notes by Doctor Shantz.

50055. DIOSCOREA sp. Dioscoreaceæ. **Yam.**

"(No. 515. Kindu. January 28, 1920.) Aerial tubers of one of the most common vines. It may be valuable as an ornamental, as well as a food plant."

50055 and 50056—Continued.

50056. GLADIOLUS sp. Iridaceæ. **Gladiolus.**

"(No. 458. Kulu. January 19, 1920. Herb. No. 595.) Bulbs of a small white gladiolus with occasionally a touch of pink and two purple blotches surrounded by yellow on the lower petals. The same form was found at Kabwe."

50057 and 50058. PISTACIA VERA L. Anacardiaceæ. **Pistache.**

From Athens, Greece. Cuttings presented by B. Krimpas, director, Royal Society of Agriculture. Received April 22 and 24, 1920.

A variety bearing unusually large pistache nuts which were included in an exhibit at the Panama-Pacific International Exposition in 1915.

50057. Cuttings from a pistillate tree.

50058. Cuttings from a staminate tree.

50059 to 50068.

From Elizabethville, Belgian Kongo. Collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received April 8, 1920. Quoted notes by Doctor Shantz.

50059. DATURA STRAMONIUM L. Solanaceæ.

"(No. 394. January 5, 1920.) Seeds of a white-flowered form."

50060. ELEUSINE CORACANA (L.) Gaertn. Poaceæ. **Ragi millet.**

"(No. 388. January 5, 1920.) Seeds used chiefly in making native beer."

For previous introduction, see S. P. I. No. 46295.

50061. MORAEA sp. Iridaceæ.

"(No. 398. January 5, 1920. Herb. No. 522.) Bulbs of a small dark-purple, almost black gladioluslike plant."

50062. IMPATIENS sp. Impatientaceæ.

"(No. 393. January 5, 1920. Herb. No. 523.) Seeds of an attractive, low, red-stemmed form found in wet clay soils."

50063. LACTUCA sp. Cichoriaceæ.

"(No. 392. January 5, 1920.) Seeds of a cichoriaceous plant."

50064. PANICUM sp. Poaceæ. **Grass.**

"(No. 395. January 5, 1920. Herb. No. 496.) Seeds of a loose-panicled Panicum."

50065. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

"(No. 389. January 5, 1920.) Sold to the natives for food."

50066. (Undetermined.)

"(No. 397. January 5, 1920. Herb. No. 520.) Seeds of a spiny-stemmed tree with small flowers. The wood is useful."

50067. ZEA MAYS L. Poaceæ. **Corn.**

"(No. 386. January 5, 1920.) Corn secured from Elizabethville; the kind sold to natives for food."

50068. (Undetermined.)

"(No. 396. January 5, 1920.) Seeds of a low bush bearing small orange-colored fruits."

50069 to 50091.

From Belgian Kongo. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received April 8, 1920. Quoted notes by Doctor Shantz.

50069. ANNONA SQUAMOSA L. Annonaceæ. **Sugar-apple.**

"(No. 477. Kongolo. January 22, 1920.) Fruit sweet and of very good flavor."

For previous introduction, see S. P. I. No. 47875.

50070. BRACHYSTEGIA sp. Cæsalpiniaceæ.

"(No. 504. Kindu. January 26, 1920.) Large beans from a forest tree."

50071. CAESALPINIA PULCHERRIMA (L.) Swartz. Cæsalpiniaceæ.

"(No. 476. Kongolo. January 22, 1920.) A red-flowered shrub, probably the same as No. 437 [S. P. I. No. 49688], but much better developed. It is a very attractive ornamental."

For previous introduction, see S. P. I. No. 7266.

50072. CANNA INDICA L. Cannaceæ.

"(No. 480. Malele. January 23, 1920. Herb. No. 609.) A wild canna with a small red flower; very abundant in this section."

50073. CUCUMIS MELO L. Cucurbitaceæ. **Muskmelon.**

"(No. 499. Kindu. January 26, 1920.) Seeds secured from a native melon; these seeds are eaten by the natives."

50074 and 50075. CUCURBITA PEPO L. Cucurbitaceæ. **Squash.**

50074. "(No. 465. Kabwe. January 19, 1920.) Looks like a melon; 8 inches long by 4 inches in diameter; green with white stripes."

50075. "(No. 498. Kindu. January 26, 1920.) A light-yellow squash used as a table vegetable."

50076. FUNTUMIA ELASTICA (Preuss) Stapf. Apocynaceæ. **Lagos rubber tree.**

"(No. 492. Kindu. January 26, 1920.) A plant common on the forest floor."

For previous introduction, see S. P. I. No. 42367.

50077. HOLCUS SORGHUM EFFUSUS (Hack.) Hitchc. Poaceæ. **Kamerun grass.**

"(No. 468. Kayombe. January 20, 1920. Herb. No. 602.) Tall, more slender plants; not eaten by the wild elephants which had eaten adjacent grasses."

50078. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc. Poaceæ. **Tabucki grass.**

"(No. 471. Kapako, near Ankoro. January 21, 1920. Herb. No. 606.) Seeds from several plants."

50079. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**

"(No. 479. Kasongo. January 23, 1920. Herb. No. 607.) A tall dark form; abundant here. Like all the others it is branched at every upper node."

50080. MANIHOT ESCULENTA Crantz. Euphorbiaceæ. **Cassava.**
(*M. utilissima* Pohl.)

"(No. 490. Kindu. January 26, 1920.) From plants partly wild, at the edge of the forest; grown everywhere about here."

50069 to 50091—Continued.

50081. PANICUM MAXIMUM Jacq. Poaceæ. **Grass.**

"(No. 472. Kapako. January 21, 1920. Herb. No. 605.) A very tall loose-headed grass."

For previous introduction, see S. P. I. No. 47032.

50082. PENTACLETHRA MACROPHYLLA Benth. Mimosaceæ.

"(No. 481. Malele. January 23, 1920.) Very large beans purchased from natives; used as an ornament. Probably from a forest tree."

For previous introduction, see S. P. I. No. 34351.

50083 and 50084. RICINUS COMMUNIS L. Euphorbiaceæ. **Castor-bean.**

50083. "(No. 491. Kindu. January 26, 1920.) Castor-beans."

50084. "(No. 503. Kindu. January 26, 1920.) Castor-beans."

50085 and 50086. SESAMUM ORIENTALE L. Pedaliaceæ. **Sesame.**

50085. "(No. 478. Kongolo to Malele. January 23, 1920.) Grown by the natives for oil. It has a smaller flower and larger pod than the wild form sent in under No. 475 [S. P. I. No. 50034]. Collected at about kilometer 265."

50086. "(No. 487. Kindu. January 26, 1920.) Grown by the natives for oil; used in every village. The stems with the nearly ripe pods are placed in a basket in the sun and the seeds allowed to shell out as the pods dry."

50087. SOLANUM sp. Solanaceæ.

"(No. 493. Kindu. January 26, 1920.)"

50088. SOLANUM sp. Solanaceæ.

"(No. 496. Kindu. January 26, 1920.)"

50089. URENA LOBATA L. Malvaceæ.

"(No. 482. Kibombo. January 24, 1920.) A malvaceous fiber plant used to make a strong burlap or cloth and for other purposes."

50090. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

"(No. 500. Kindu. January 26, 1920.) Beans secured from a native; these differ from most of the kafir beans previously sent in."

50091. (Undetermined.)

"(No. 485. From 60 kilometers south of Kindu. January 24, 1920. Herb No. 619.) A bush with yellow almondlike fruits; said by the natives to be useless."

50092 to 50101.

From La Plata, Argentina. Seeds presented by Dr. Carlos Spegazzini. Received April 23, 1920.

50092. PROSOPIS ALBA Griseb. Mimosaceæ.

An Argentine tree which yields a gum that is used by the natives of the interior provinces as a dyeing material, giving a dark-red color resistant to the action of light and water. (Adapted from *Trabajos del Museo de Farmacología de la Facultad de Ciencias Médicas, Buenos Aires No. 23, p. 1.*)

50093. PROSOPIS CAMPESTRIS Griseb. Mimosaceæ.

An Argentine shrub with tangled intertwined branches, strong spiny stipules, and pale golden yellow flowers. These shrubs form extensive groups on the plains. (Adapted from *Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen, vol. 19, p. 132.*)

50092 to 50101—Continued.

50094. PROSOPIS CHILENSIS (Molina) Stuntz. Mimosaceæ. **Algaroba.** (*P. juliflora* DC.)

One of the best sources of honey; its seeds are valuable for cattle and poultry.

For previous introduction, see S. P. I. No. 46973.

50095. PROSOPIS DENUDANS Benth. Mimosaceæ.

A low shrub from Patagonia, with short graceful leafy branches and twisted pods. The pinnate leaves are in fascicles; the inner surfaces of the petals are woolly. (Adapted from *Hooker, Journal of Botany, vol. 4, p. 351.*)

50096. PROSOPIS DULCIS DC. Mimosaceæ.

A thorny tree, 60 feet high, with very deep roots, adapted for live fences. The hard, strong, durable wood when polished resembles mahogany. The sweetish pods, rich in protein, grape sugar, starch, pectin, potash, lime, and phosphoric acid, are used for cattle fodder and even for human food; a sparkling drink called *aloja* is made from the pods. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 421.*)

50097. PROSOPIS FLEXUOSA (Lag.) DC. Mimosaceæ.

A very smooth tree with short spiny stipules, narrow leaflets, and flowers in cylindrical spikes. The rounded pods are twisted. Native to Chile. (Adapted from *Lagasca, Genera et Species Plantarum, p. 16.*)

50098. PROSOPIS NIGRA Hieron. Mimosaceæ.

A stout, low, bushy plant abundant in Corrientes, Argentina, with strong, beautiful wood much used in this region for furniture, doors, windows, carriages, etc. (Adapted from *Lillo, Contribución al Conocimiento de los Arboles de la Argentina, p. 53.*)

50099. PROSOPIS PANTA Hieron. Mimosaceæ.

A low, branching, edible-fruited tree which is distinguished from the common algarobas by its longer and wider fruit. The rosy wood is somewhat hard and on being cut emits a pleasant melonlike odor; it is used for posts and for firewood. (Adapted from *Lillo, Contribución al Conocimiento de los Arboles de la Argentina, p. 55.*)

50100. PROSOPIS PATAGONICA Speg. Mimosaceæ.

A shrub, native to southern Patagonia, 2 to 3 meters high, with spiny branches. The small green campanulate flowers are in dense cylindrical spikes from the center of the leaf clusters. (Adapted from *Revista de la Facultad de Agronomía y Veterinaria, Nos. 30 and 31, p. 510.*)

50101. PROSOPIS SILIQUASTRUM (Lag.) DC. Mimosaceæ.

A Chilean tree about 20 to 30 feet high, growing from Coquimbo to the Cachapoal River. The pods are much relished by animals. The wood is violet-brown, very hard, and used by wheelwrights; it gives very good charcoal. The seed is much appreciated medicinally for cardiac troubles on account of the tannin it contains. (Adapted from *Bulletin de la Société Nationale d'Acclimatation de France, vol. 65, p. 112.*)

50102 to 50206.

From Burttholm, Vereeniging, Transvaal. Seeds presented by J. Burtt Davy. Received May 6, 1920. Quoted notes by Mr. Burtt Davy.

50102. ACACIA GIRAFFAE Willd. Mimosaceæ.

"*Kameel doorn.* A valuable timber tree for arid regions in the warm Temperate Zone. The ripe pods are eaten greedily by stock. It thrives in sandy soil, attains a large size, and the dark reddish brown wood is used by the natives in making spoons, knife handles, etc."

For previous introduction, see S. P. I. No. 46805.

50102 to 50206—Continued.

50103. ACACIA LITAKUNENSIS Burchell. Mimosaceæ.

"(No. 228/19.) Waterberg district, Transvaal."

A tree up to 40 feet in height native to the Transvaal, called *moshu* by the natives. It has a singularly twisted bivalve pod (Adapted from *Harvey and Sonder, Flora Capensis, vol. 2, p. 283.*)

For previous introduction, see S. P. I. No. 28662.

50104 and 50105. ACACIA GLANDULIFERA Schinz. Mimosaceæ.

50104. "(No. 238/19.) Waterberg district, Transvaal." A reddish brown shrub, up to 5 meters in height, native to southwestern Africa. It has bipinnate leaves and glanduliferous oblong pods about 35 millimeters long. (Adapted from *Mémoires de l'Herbier Boissier, 1900, p. 111.*)

50105. "Waterberg district, Transvaal."

50106. ACACIA LITAKUNENSIS Burchell. Mimosaceæ.

"(No. 228/19.) Waterberg district, Transvaal."

50107. ACACIA PALLENS (Benth.) Rolfe. Mimosaceæ.

"Seeds of the kopjes doorn, one of the most valuable mine-timber trees of the warmer parts of the bush veldt."

A medium-sized tree, with a spiny trunk and branches, compound leaves 8 to 10 centimeters long, and dense flower spikes 4 to 6 centimeters long. It is considered a valuable timber tree in the Transvaal, where it is native, the wood being very hard and durable underground. (Adapted from *Kew Bulletin of Miscellaneous Information, 1907, p. 361.*)

50108. ACACIA ROBUSTA Burchell. Mimosaceæ.

"(No. 229/19.) *Mooku* (Sesutu). Collected at Potgietersrust, August 29, 1919."

A tree, 15 to 25 feet high, with a much-branched dilated crown and much-crowded odorous yellow flowers. It is not uncommon in mixed woods in Angola, where it is native. (Adapted from *Hiern, Catalogue of Welwitsch's African Plants, p. 314.*)

For previous introduction, see S. P. I. No. 28550.

50109 and 50110. ACACIA SCORPIOIDES (L.) W. F. Wight. Mimosaceæ. (*A. arabica* Willd.) **Babul.**

"Variety *kraussiana*. Waterberg district, Transvaal."

The typical form of this species is a pubescent yellow-flowered shrub, which produces the white transparent gum arabic called "gum thus." The wood is strong and durable and is used for many purposes. A decoction of the bark is used for soap, and the pods are used for tanning.

For previous introduction, see S. P. I. No. 48063.

50109. "Waterberg district, Transvaal."

50110. "(No. 235/19.) Waterberg district, Transvaal. Small tree; pods eaten by stock."

50111. ACACIA sp. Mimosaceæ.

"(No. 231/19.) Potgietersrust, August 29, 1919."

50112. ACACIA GLANDULIFERA Schinz. Mimosaceæ.

"(No. 238/19.) A shrub collected at Potgietersrust, August 29, 1919."

50113. ACACIA sp. Mimosaceæ.

"(No. 222/19.) Potgietersrust, Waterberg district, Transvaal."

50102 to 50206—Continued.

50114. ACACIA sp. Mimosaceæ.

"*Moobanga*. Elizabethville, Belgian Kongo."

50115. ACANTHOSICYOS HORRIDA Welw. Cucurbitaceæ.

"Narra seeds; Protectorate of Southwest Africa. From a very hot, arid region."

This plant, which belongs to the gourd family, is found on the dunes on the coast of the Protectorate of Southwest Africa; it continues to grow with the height of the dune, sending down roots to a considerable depth. The natives are very fond of the juicy flesh of the roundish fruit, which is about 9 inches in diameter. The seeds, which are very nutritious, have been used by Europeans in Cape Town as a substitute for almonds, and the natives are very fond of them. (Adapted from *Kew Bulletin of Miscellaneous Information, 1907, p. 342.*)

For previous introduction, see S. P. I. No. 34734.

50116. AGATHOSMA CHORTOPHILA Eckl. and Zeyh. Rutaceæ.

An erect, many-stemmed evergreen shrubby plant, a foot or more high, native to the Cape of Good Hope. The leaves are erect and oblong-linear, and the flowers are borne in umbels. (Adapted from *Harvey and Sonder, Flora Capensis, vol. 1, p. 435.*)

For previous introduction, see S. P. I. No. 47952.

50117. AMYGDALUS COMMUNIS L. Amygdalaceæ. **Almond.**
(*Prunus amygdalus* Stokes.)

"Frost-resisting almond from the high veldt, Transvaal."

50118. ANACARDIUM OCCIDENTALE L. Anacardiaceæ. **Cashew.**

"Manicaland, Southern Rhodesia. Collected by Maj. R. Gordon on his 1919 trip."

A tree, up to 40 feet in height, with large leaves and close-grained, strong, and durable wood. The fruit consists of a small nut borne upon a pear-shaped red or yellow fleshy receptacle 2 to 4 inches long. This receptacle is edible and quite harmless when ripe, having an agreeable subacid flavor, and is also very good when cooked. The kidney-shaped nut contains a single large kernel which is very delicious when cooked, having a nutty flavor; it should not be eaten unless cooked, however, because of the poisonous juices of the shell, which must be driven off by heat. (Adapted from *Cook and Collins, Economic Plants of Porto Rico, p. 75.*)

For previous introduction, see S. P. I. No. 45915.

50119. ASPARAGUS sp. Convallariaceæ.

"(No. 239/19.) Potgietersrust; August 29, 1919. A climber; stipular spines very thick, recurved."

50120 and 50121. BALANITES AEGYPTIACA (L.) Delile. Zygophyllaceæ.

A tropical African tree, 3 to 5 meters high, with papery woolly leaves and edible stone fruits 3 centimeters long, rather bitter in flavor. The natives make an intoxicating liquor from these fruits and also eat them raw. The seeds yield an oil known as betu, which is used for food, as a liniment, and to some extent as a medicine. One of the ingredients of the celebrated spikenard perfume is supposed to have been furnished by this tree. (Adapted from *Post,*

50102 to 50206—Continued.

Flora of Syria, p. 199, and from *Kew Bulletin of Miscellaneous Information, Additional Series IX, p. 138.*)

For previous introduction, see S. P. I. No. 44563.

50120. "(No. 162/19; Herb. No. 17914.) *Mookoonkoole.* Kongo trip."

50121. A smaller fruited variety.

50122. BALANITES MAUGHAMII Sprague. Zygophyllaceæ. **Manduro.**

"Seeds found along the Zambezi River near Chivamba; the boys say it is a thorny tree. Collected by Maj. R. Gordon, August 14, 1919. Native name, *mwanjondo.*"

For previous introduction, see S. P. I. No. 39196.

50123. BAROSMA BETULINA (Bergius) Bartl. and Wendl. Rutaceæ.

This species is the most valuable species of Barosma from a commercial standpoint, as it contains the greatest number of oil glands in its small light-green leaves. It is a rather compact evergreen shrub, attaining a height of 3 or 4 feet, and is found at altitudes of 1,000 to 2,000 feet in South Africa. (Adapted from *The Agricultural Journal of South Africa, vol. 6, p. 83.*)

For previous introduction, see S. P. I. No. 47953.

50124. BAROSMA CRENULATA (L.) Hook. Rutaceæ. **Buchu.**

The large-leaved buchu is often distinguished as the "true buchu." It is a twiggy shrub, 3 to 4 feet high, with numerous pale purplish flowers produced in October and November. As with the preceding species, *Barosma betulina*, the oil glands on the leaves yield a greenish yellow oil. This oil, when exposed to the cold, deposits a solid Barosma camphor which, when purified, has the odor of peppermint. This camphor is used in remedies for bladder and kidney troubles. (Adapted from *The Agricultural Journal, Cape Colony, vol. 6, p. 146.*)

For previous introduction, see S. P. I. No. 47954.

50125. BARYXYLUM AFRICANUM (Sond.) Pierre. Cæsalpiniaceæ.
(*Peltophorum africanum* Sond.)

"(No. 224/19.) *M'seschla* (Sesutu). Common and characteristic small tree of Transvaal bush veldt. Wood hard, well colored, and valuable."

A handsome tree, native to Angola, Africa, 20 to 30 feet high, with a habit like Mimosa. It has bipinnate leaves, attractive saffron-yellow flowers, and flat 2-seeded pods. (Adapted from *Hiern, Catalogue of Welwitsch's African Plants, p. 287.*)

For previous introduction, see S. P. I. No. 48235.

50126. BAUHINIA RETICULATA DC. Cæsalpiniaceæ.

"*Kifumbe.* Elizabethville, Belgian Kongo."

A rather small tree, native to southern tropical Africa, with leathery bilobed leaves and whitish or pinkish flowers. The bark and leaves are crushed and used as an application for wounds and ulcers; the tree is sometimes cultivated in Angola for this purpose. (Adapted from *Hiern, Catalogue of Welwitsch's African Plants, p. 296.*)

50127. BAUHINIA sp. Cæsalpiniaceæ.

"From Pemba Island, near Zanzibar. A shrub with white flowers, resembling the Christmas rose."

50128. BRACHYSTEGIA sp. Cæsalpiniaceæ.

"A tree known as Bangiri, found at Villa Fontes on the Zambezi River. Rather like a poplar, but with darker leaves. The wood seems rather soft, and

50102 to 50206—Continued.

the bark scales off like silver paper. The tree grows about 40 or 50 feet tall, perhaps bigger, and the boys say that the natives use them to make canoes. Collected by Maj. R. Gordon, August 2, 1919."

50129. BRACHYSTEGIA sp. Cæsalpiniaceæ.

"*Moosoombi;* a big acacialike tree; good wood; grows in Manicaland, Rhodesia. Collected by Maj. R. Gordon in October, 1919."

50130. BRACHYSTEGIA sp. Cæsalpiniaceæ.

"*Musamba.* Elizabethville, Belgian Kongo."

50131. BRACHYSTEGIA sp. Cæsalpiniaceæ.

"*Mutawndu.* Elizabethville, Belgian Kongo."

50132. CAILLIEA NUTANS (Pers.) Skeels. Mimosaceæ.
(*Dichrostachys nutans* Benth.)

"(No. 221/19.) Potgietersrust, Transvaal. *Sikkel-bosch; m'tetempa.* A valuable hardwood tree of the bush veldt; much sought for fence posts. It is also ornamental."

For previous introduction, see S. P. I. No. 43645.

50133. CAPRIOLA INCOMPLETA (Nees) Skeels. Poaceæ. **Grass.**
(*Cynodon incompletus* Nees.)

"This species spreads by surface runners and does not produce stolons as does *Cynodon dactylon.* It is difficult to collect seed, as the grass is so closely grazed by stock of all sorts."

For previous introduction, see S. P. I. No. 46567.

50134. CASSIA sp. Cæsalpiniaceæ.

"*Mupuala.* Elizabethville, Belgian Kongo."

50135. ACACIA sp. Mimosaceæ.

"(No. 231/19.)"

50136. CEIBA PENTANDRA (L.) Gaertn. Bombacaceæ. **Kapok.**
(*Eriodendron anfractuosum* DC.)

"*Kapok,* vegetable silk."

"The kapok tree, native in the American Tropics, is widely distributed in the Tropics of both hemispheres. It attains a height of 75 to 100 feet, with widespreading branches. It begins to bear seed pods when about 5 years old, and the yield of pods increases with the age of the tree. Well-developed trees under favorable circumstances yield about 7,000 pounds for pillows, mattresses, life preservers, etc., and its use is rapidly increasing." (*L. H. Dewey.*)

For previous introduction, see S. P. I. No. 46522.

50137. CHENOPODIUM AMARANTICOLOR Coste and Reynier. Chenopodiaceæ.

"From Algeria. When young this forms an excellent substitute for spinach."

For previous introduction, see S. P. I. No. 30381.

50138 to 50140. CITRULLUS VULGARIS Schrad. Cucurbitaceæ. **Watermelon.**

50138. "*Golden.* Vereeniging, Transvaal."

50139. "Vereeniging, Transvaal."

50140. "Vereeniging, Transvaal."

50141. COFFEA EXCELSA Cheval. Rubiaceæ. **Coffee.**

This species of Coffea is native to central Africa and has been experimented with in Trinidad, British West Indies. It shows a satisfactory percentage of caffein and though somewhat bitter, has an excellent flavor. (Adapted from *Bulletin of the Department of Agriculture, Trinidad and Tobago, vol. 17, p. 62*).

50102 to 50206—Continued.

50142. COFFEA LAURENTII Wildem. Rubiaceæ. **Coffee.**

A white-flowered shrub, native to Belgian Kongo, with dark-green, oval acuminate leaves up to 30 centimeters in length and shortly elliptic 2-seeded fruits. The roundish seeds are 9 to 11 millimeters long. (Adapted from *Actes du Premier Congrès de Botanique, 1900, p. 234.*)

For previous introduction, see S. P. I. No. 32359.

50143. COIX LACRYMA-JOBI L. Poaceæ. **Job's-tears.**

"A hardy form grown at an altitude of 4,850 feet."

For previous introduction, see S. P. I. No. 48012.

50144. COMBRETUM sp. Combretaceæ.

"(No. 245/19.) From The Matoppos, Matabeleland."

50145. COMBRETUM sp. Combretaceæ.

"(No. 233/19.) Potgietersrust, Waterberg district, Transvaal."

50146. COMBRETUM sp. Combretaceæ.

"Seeds of a tree somewhat like an olive in foliage but much larger, being 40 to 50 feet high. It is a larger spreading tree, giving a good shade; apparently hard wooded. The native name is *Cotamo*. Collected by Maj. R. Gordon at Shemba, Zambezi River, Mozambique, August 8, 1919."

50147. DIPLORHYNCHUS sp. Apocynaceæ.

"*Manyanyata*. A tree near Elizabethville, Belgian Kongo."

50148. DIPLORHYNCHUS sp. Apocynaceæ.

"*Mwenge*."

50149. ELEPHANTORRHIZA ELEPHANTINA (Burch.) Skeels. Mimosaceæ. (*E. burchellii* Benth.)

"Root used in tanning and dyeing stuffs a brown color."

For previous introduction, see S. P. I. No. 46902.

50150. ERAGROSTIS CURVULA (Schrad.) Nees. Poaceæ. **Grass.**

A very densely tufted South African perennial grass with tender erect stems 1 to 2 feet high and narrow blades sometimes more than a foot in length. (Adapted from *Thistleton-Dyer, Flora Capensis, vol. 7, p. 599.*)

For previous introduction, see S. P. I. No. 38767.

50151. ERYTHRINA CAFFRA Thunb. Fabaceæ.

"Magaliesberg, Transvaal."

A tree, 30 to 60 feet high, with prickly branches, trifoliolate leaves with broadly ovate leaflets, and scarlet flowers borne in dense, many-flowered racemes. It is native to South Africa. (Adapted from *Harvey and Sonder, Flora Capensis, vol. 2, p. 236.*)

50152. GAZANIA sp. Asteraceæ.

"A yellow Gazania from Mr. Healtie, Addo, Southern Provinces, Nigeria."

50153 and 50154. GREWIA MONTICOLA Sond. Tiliaceæ.

A much-branched spreading shrub with densely tomentose twigs and almost sessile, unequally sided leaves. The flowers are borne in axillary few-flowered clusters. The shrub is native to the Transvaal. (Adapted from *Harvey and Sonder, Flora Capensis, vol. 1, p. 226.*)

50153. "(No. 236/19.) Potgietersrust, Transvaal. Small evergreen tree."

50154. "(No. 232/19.) Waterberg district, Transvaal. Fruit edible."

50102 to 50206—Continued.

50155. GUIZOTIA ABYSSINICA (L. f.) Cass. Asteraceæ.

"*Ramtil.* An African oil seed."

An annual composite, native to tropical Africa, but cultivated in most of the Provinces of India for the sake of the oil-producing seeds. The seed is sown from June to August and harvested in November and December; it prefers light sandy soil. The pale-yellow oil is used for making paints, for lubrication, and for lighting purposes. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 4, p. 186.*)

For previous introduction, see S. P. I. No. 44789.

50156. HIBISCUS MUTABILIS L. Malvaceæ.

"Elizabethville, Belgian Kongo."

A tall East Indian shrub with large, broad, cordate leaves and large white flowers which change to red. It blooms in summer and late autumn and is considerably planted in the Bermudas in gardens and hedges. (Adapted from *Britton, Flora of Bermuda, p. 238.*)

For previous introduction, see S. P. I. No. 47357.

50157. LAGENARIA VULGARIS Seringe. Cucurbitaceæ. **Gourd.**

"Calabash gourd. Belgian Kongo."

50158. LANDOLPHIA sp. Apocynaceæ.

"(No. 146/19.) Elizabethville, Belgian Kongo. Yields a rubber."

50159. LEONOTIS sp. Menthaceæ.

A mint allied to the *molonillo* of Porto Rico, a cosmopolitan plant of the Tropics used for various medicinal purposes.

50160. LINUM USITATISSIMUM L. Linaceæ. **Flax.**

"Sample of linseed from northern Manchuria."

50161. LOBELIA ERINUS MICRODON (DC.) Sond. Lobeliaceæ. **Lobelia.**

"An ornamental annual, entirely different in habit from the ordinary garden form, being erect instead of diffuse. The fragrant flowers are beautiful shades of blue and white."

For previous introduction, see S. P. I. No. 46808.

50162. MELINIS MINUTIFLORA Beauv. Poaceæ. **Molasses grass.**

"*Bandeira* grass."

A low compact-growing grass, native to central Brazil, where it is called *capim gordura* on account of a slightly glutinous matter which exudes from the stems. It is very rank and sometimes runs out all other vegetation. Cattle are very fond of this grass. (Adapted from *Journal of the Royal Horticultural Society, vol. 3, p. 253.*)

For previous introduction, see S. P. I. No. 47162.

50163 to 50165. MIMUSOPS ZEYHERI Sond. Sapotaceæ.

A large shrub or small tree, native to the Kalahari region, Transvaal. The long-stemmed, oblong-lanceolate leaves are 3 to 4 inches in length, and the edible drupes are about an inch long and sweetish in flavor. (Adapted from *Harvey and Sonder, Flora Capensis, vol. 4, sec. 1, p. 441.*)

50163. "*Moople.*"

50164. "Magaliesberg, Transvaal."

50165. "Magaliesberg, Transvaal."

50166. PANICUM LAEVIFOLIUM Hack. Poaceæ. **Grass.**

Variety *pictum.*

50102 to 50206—Continued.

50167 and 50168. PARINARI MOBOLA Oliver. Rosaceæ.

A very handsome tree, 20 to 40 feet high, native to Angola, with dense evergreen foliage, and very ornamental because of the leaves being deep green above with snow-white lower surfaces. The wood is used for the manufacture of furniture and for building, and the elliptic-ovoid fruits, about the size of a hen's egg, are edible, the pulp resembling a mixture of honey and meal in flavor and texture. (Adapted from *Hiern, Catalogue of Welwitsch's African Plants, p. 320.*)

For previous introduction, see S. P. I. No. 32395.

50167. "*Mupundu.* Elizabethville, Belgian Kongo."

50168. "*Momvula* or *macacata.* A dark-leaved evergreen tree which grows in Angola and Manicaland, Rhodesia. It bears good edible fruit much relished by the natives. It also makes a good shade tree."

50169 and 50170. PHASEOLUS ACUTIFOLIUS LATIFOLIUS G. F. Freeman. Fabaceæ. **Tepary bean.**

50169. "Small white haricot beans. Vereeniging, Transvaal."

50170. "Small white haricot beans grown at Burttholm, Vereeniging, Transvaal."

50171. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean.**

"Grown successfully at Burttholm, Vereeniging, Transvaal. Seed obtained at a local agricultural show."

50172 and 50173. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

50172. "Amersfoort Show, March, 1917. Small haricot."

50173. "Small white haricot of the Transvaal."

50174. PHORMIUM TENAX Forst. Liliaceæ. **New Zealand flax.**

"From Kenneth Austin. A fiber plant from California, U. S. A."

For previous introduction, see S. P. I. No. 47572.

50175. PHYSALIS sp. Solanaceæ.

"Much used in making jam in the Transvaal. This is not the ordinary *Physalis peruviana*, or Cape gooseberry."

50176. PISUM SATIVUM L. Fabaceæ. **Garden pea.**

"Peas from the Amersfoort Show, March, 1917."

50177. PSEUDOLACHNOSTYLIS sp. Euphorbiaceæ.

"*Mutatye.*"

50178. PTEROCARPUS ANGOLENSIS DC. Fabaceæ.

"(No. 242/19.) From the Matoppos, Matabeleland. A timber tree valuable for furniture."

An unarmed tree, native to the western part of central Africa. It has alternate, unequally pinnate leaves, axillary or terminal racemes of flowers, and flat one-seeded, almost round pods. The reddish wood is used in dyeing, and the bark contains a large quantity of tannin. (Adapted from *De Lanessan, Plantes Utiles des Colonies Françaises, p. 799.*)

50179. PTEROCARPUS SERICEUS Benth. Fabaceæ.

"(No. 246/19.) From the Matoppos, Matabeleland."

An unarmed tree, native to South Africa, with alternate, unequally pinnate leaves shining silky beneath or on both sides and oval-roundish pods about 1½ inches long. (Adapted from *Harvey and Sonder, Flora Capensis, vol. 2, p. 264.*)

50102 to 50203—Continued.

50180. PTEROCARPUS sp. Fabaceæ.

"Waterberg district, Transvaal."

50181. RHUS sp. Anacardiaceæ.

"(No. 240/19.) Potgietersrust, August 29, 1919."

50182. RHUS sp. Anacardiaceæ.

"(No. 230/19.) Potgietersrust, August 29, 1919."

50183. SCHOTIA TRANSVAALENSIS Rolfe. Cæsalpiniaceæ.

"(No. 237/19.) A very ornamental evergreen shade tree, with brilliant scarlet flowers; from the Waterberg district, Transvaal. Native name, *boerboom*."

50184. STERCULIA sp. Sterculiaceæ.

"*Nhengali*. A very tall tree; possibly 50 feet of clear trunk before the branches begin. The trunk is white, and the soft wood makes excellent paper; the wood is not so soft as that of the baobab tree (*Adansonia digitata*). Collected by Maj. R. Gordon, March 8, 1919."

50185. STRYCHNOS sp. Loganiaceæ.

"(No. 201/19.) Wood halt near Baya, Katanga."

50186. TAMARINDUS INDICA L. Cæsalpiniaceæ. **Tamarind.**

"A fine shade tree known in Queensland as tamarind; cultivated there but wild in Mozambique. Native name *Malleta*. Collected on the Zambezi River by Maj. R. Gordon, August 6, 1919."

For previous introduction, see S. P. I. No. 47983.

50187 and 50188. TERMINALIA SERICEA Burchell. Combretaceæ.

A tree, 2 to 10 meters high, with a flat crown, silvery white foliage, and yellow wood. It is called *geelhout* by the Boers and *mugorro* by the Kafirs. It is distributed from South Africa to Angola. (Adapted from *H. Baum, Kunene-Sambesi Expedition, p. 321.*)

50187. "(No. 223/19.) Potgietersrust. *Bosch Vaal-bosch; M'vanunu* (Sesutu). A hard, durable wood."

50188. "(No. 247/19.) From the Matoppos, Matabeleland."

50189. TOUNATEA MADAGASCARIENSIS (Desv.) Kuntze. Cæsalpiniaceæ. (*Swartzia madagascariensis* Desv.)

An African tree, 12 to 30 feet in height, with very heavy wood which is deep red in color. It is said to be excellent for piano manufacture and good for all high-class furniture work. It is a very durable and valuable timber. (Adapted from *Holland, Useful Plants of Nigeria, vol. 1, p. 248.*)

50190. UAPACA SANSIBARICA Pax. Euphorbiaceæ.

"*Mahobohobo*, or *massangi:* both names are correct. A large-leaved evergreen with wood used for timber and edible fruits. Collected by Maj. R. Gordon in Manicaland, Rhodesia."

For previous introduction, see S. P. I. No. 32394.

50191. UAPACA sp. Euphorbiaceæ.

"*Musuku*. Elizabethville, Belgian Kongo."

50192. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

"Cowpea grown by natives of Pondoland."

50102 to 50206—Continued.

50193. VITEX REHMANNI Guerke. Verbenaceæ.

"(No. 226/19.) Potgietersrust. *Mookwele* (Sesutu). Common and characteristic tree up to 20 feet high."

A shrub with opposite 3 or 5 foliolate leaves with elliptic profusely glandular leaflets, axillary cymes of bell-shaped flowers, and cone-shaped drupes about a quarter of an inch long. It is native to Natal and the Kalahari region, Transvaal. (Adapted from *Thiselton-Dyer, Flora Capensis, vol. 5, sec. 1, p. 214.*)

50194 and 50195. ZIZIPHUS MUCRONATA Willd. Rhamnaceæ.

A much-branched tree, 15 to 20 feet high, found in South Africa and central Africa. The ovate leaves are up to 2 inches in length, the yellowish flowers are borne in axillary cymes, and the red drupes are about the size of cherries. (Adapted from *Harvey and Sonder, Flora Capensis, vol. 1, p. 475.*)

50194. "Valuable wood."

50195. "Good wood for fence posts, hard and durable and drought resistant."

50196. ZIZIPHUS sp. Rhamnaceæ.

"*Kankole.* Elizabethville, Belgian Kongo."

50197. ZIZIPHUS sp. Rhamnaceæ.

"(No. 227/19.) Potgietersrust."

50198. ZIZIPHUS sp. Rhamnaceæ.

"(No. 243/19.) From the Matoppos, Matabeleland. Much like *Ziziphus mucronata*, but the fruits are much larger."

50199. (Undetermined.)

"(No. 142/19.) *Mooloo'alwa.* Elizabethville, Belgian Kongo. There are two trees going under this name; this is the lesser or 'kiloko' sort."

50200. (Undetermined.)

"Vereeniging, Transvaal."

50201. (Undetermined.)

"(No. 234/19.) Potgietersrust. An ornamental shrub."

50202. (Undetermined.)

"Shrub or small tree."

50203. (Undetermined.)

"(No. 225/19.) Potgietersrust. *Mookwerikweri* (Sesutu). Small evergreen tree."

50204. (Undetermined.)

"*Maviling hombwa.* Tree near Elizabethville, Belgian Kongo."

50205. (Undetermined.)

"Collected in Manicaland, Rhodesia, by Maj. R. Gordon."

50206. (Undetermined.)

"*Kimpampa.* Elizabethville, Belgian Kongo. Ornamental tree."

50207. BRACHYSTEGIA sp. Cæsalpiniaceæ.

From Kafue, Northern Rhodesia. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Numbered June 7, 1920.

"(No. 300 in part. Bolenga Camp on the Kafue River. November 25, 1919.) *Mombo* (Chinyanja). A large, spreading, acacialike tree with large pods and large, flat seeds; it is most useful as well as ornamental. The seed is eaten by the natives

and by baboons. The bast fiber, formerly used to make cloth, is now used whenever fiber is required. The bark when pounded furnished the chief cloth used by the natives before the introduction of cloth by the whites." (*Shantz.*)

50208 to 50210.

From Hobart, Tasmania. Seeds presented by L. A. Evans, Acting Director of Agriculture. Received May 14, 1920.

"Collected on the slopes of Mount Wellington at an altitude of about 3,000 feet." (*Evans.*)

50208. EUCALYPTUS COCCIFERA Hook. f. Myrtaceæ.

A fine tree with leaves of two forms—in the young tree they are opposite, sessile, oval, and more or less mucronate; in the adult form they are alternate, stalked, lanceolate, and hook pointed. The young branches are cylindrical and very white; the flowers are usually in tufts of seven. (Adapted from *Gardeners' Chronicle, third series, vol. 3, p. 798.*)

For previous introduction, see S. P. I. No. 10505.

50209. EUCALYPTUS MUELLERI T. B. Moore. Myrtaceæ.

A magnificent tree, 100 to 200 feet high, branchless for half its height, with light red-colored wood extremely hard and heavy and of a stringy, close-grained character. The thick shining leaves are crenulated. The tree is native to Tasmania at altitudes of 2,000 feet; it grows luxuriantly in unsheltered conditions and in poor soil. (Adapted from *Mueller, Proceedings of the Royal Society of Tasmania, p. 208.*)

For previous introduction, see S. P. I. No. 38730.

50210. EUCALYPTUS URNIGERA Hook. f. Myrtaceæ.

A small tree, 15 to 20 feet high in its native home on the summits of the Tasmanian Mountains, but occasionally reaching a height of 150 feet in cultivation; one of the hardiest of the eucalypts. The leaves of the young tree are opposite, sessile, orbicular, and green; the leaves on the adult plant are alternate, stalked, elliptic, and always green, never glaucous. The pale-yellow flowers are in groups of three, followed by urn-shaped fruits. Baron von Mueller says of this species: "It is particularly hardy and may become of sanitary importance to colder countries in malarial regions, the foliage being much imbued with antiseptic oil." (Adapted from *Gardeners' Chronicle, third series, vol. 3, pp. 460, 798.*)

For previous introduction, see S. P. I. No. 1679.

50211 to 50217.

From Chama, Coban, Guatemala. Seeds collected by Harry Johnson. Received May 3, 1920. Quoted notes by Mr. Johnson.

50211. ANNONA RETICULATA L. Annonaceæ. **Custard-apple.**

"An upright, open, heavy-bearing tree, 25 feet high, with smooth dark-green leaves 8 to 10 inches long and 2 inches broad, with acuminate tip and base. The fruit, 4 inches in length, is of a very pleasing light-red color, like the blush on the nectarine. The skin is thin, not reticulated, but the facets are slightly visible. The flesh is of the color and texture of a ripe Bartlett pear, with a flavor similar to that of the cherimoya. The seeds surround a central core which is compactly inclosed in smooth pulp. There is only one tree that I know of here at Jocolo."

For previous introduction, see S. P. I. No. 45955.

50211 to 50217—Continued.

50212. BEGONIA CONVALLARIODORA C. DC. Begoniaceæ.

"Seeds collected in Chama, from a widely distributed species which I first saw at Mocca. It grows most profusely along roadsides in the second growth, scrambling over the shrubs and undergrowth and hanging down from the banks. The white flowers, sometimes tinged on the outside with red, are produced freely in large panicles near the ends of the shoots."

50213. BEGONIA sp. Begoniaceæ.

"Collected about 2 miles out from Tactic on the road leading to Tucuru. A rhizomatous species with large, slightly hairy leaves 10 to 14 inches in diameter on petioles 18 to 36 inches long. The flower spike is 2 to 3 feet in length; the pods are strongly winged."

50214. GOSSYPIUM HIRSUTUM L. Malvaceæ. **Cotton.**

"Seeds of the cotton grown around the Lago Izabal, at Jocolo, said to have been imported many years ago from the United States."

For previous introduction, see S. P. I. No. 41917.

50215. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"This variety is said to grow into quite a tree. It is common in the region around Jocolo."

50216. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"This variety grows into a large shrub or small tree with yellow flowers. It is the common form at Chama."

50217. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

"Seeds of a black *butter bean*, as it is called here. There are two to four seeds in a pod, usually three."

50218. CHRYSOBALANUS ICACO L. Rosaceæ. Icaco.

From Chama, Coban, Guatemala. Seed collected by Harry Johnson, Received May 22, 1920.

"A fruit similar in appearance to a large ripe olive, but of sweet though rather insipid flavor. The shrub grows along the lake shore, hanging over the water, and is a free bearer." (*Johnson.*)

50219 and 50220.

From Kigoma, Belgian Kongo. Fruits collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received April 12, 1920. Quoted notes by Doctor Shantz.

50219. CITRUS sp. Rutaceæ.

"(No. 617. Kigoma. February 20, 1920.) Fruit of a lime, very abundant here and used much more than the lemon."

50220. CITRUS sp. Rutaceæ.

"(No. 619. Kigoma. February 20, 1920.) A rough lemon grown here."

50221 to 50287.

From Belgian Kongo. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received April 12, 1920. Quoted notes by Doctor Shantz.

50221. AMARANTHUS sp. Amaranthaceæ. **Amaranth.**

"(No. 547. Kongolo. February 6, 1920.) The young plants and leaves are used as greens."

50221 to 50287—Continued.

50222. BIXA ORELLANA L. Bixaceæ. **Annatto tree.**

"(No. 610. Ujiji. February 17, 1920. Herb. No. 675.) An ornamental plant; pigment is rubbed from the seeds and used by the natives as coloring material."

For previous introductions, see S. P. I. No. 44954.

50223. CAPSICUM ANNUUM L. Solanaceæ. **Red pepper.**

"(No. 557. Kongolo. February 7, 1920.) A large paprika, 2 inches long."

For previous introduction, see S. P. I. No. 47010.

50224. CEIBA PENTANDRA (L.) Gaertn. Bombacaceæ. **Kapok.**
(*Eriodendron anfractuosum* DC.)

"(No. 613. Ujiji. February 17, 1920.) Grown as a street tree."

For previous introduction, see S. P. I. No. 46522.

50225. CITRULLUS VULGARIS Schrad. Cucurbitaceæ. **Watermelon.**

"(No. 560. Kabalo. February 8, 1920.) A white-fleshed, red-seeded watermelon with a fairly good flavor."

50226. CROTALARIA STRIATA Schrank. Fabaceæ.

"(No. 572. Albertville. February 12, 1920. Herb. No. 665.) A tall leguminous plant, about 4 feet high."

For previous introductions, see S. P. I. No. 34670.

50227. DACTYLOCTENIUM AEGYPTIUM (L.) Richter. Poaceæ. **Grass.**
(*Eleusine aegyptiaca* Desf.)

"(No. 562. Kabalo. February 8, 1920.) A ruderal."

For previous introduction, see S. P. I. No. 38017.

50228. DATURA METEL FASTUOSA (L.) Safford. Solanaceæ.

"(No. 602. Kigoma. February 14, 1920. Herb. No. 669.)"

For previous introduction, see S. P. I. No. 47671.

50229. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"(No. 556. Kongolo. February 7, 1920.) One capsule with four carpels."

50230. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"(No. 564. Kabalo. February 9, 1920.) This cotton, collected at Kiluba, has a very long pod, and the seeds are closely packed together with no lint between them as in kidney cotton."

50231. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"(No. 575. Albertville, February 12, 1920. Herb. No. 663.) A cotton plant 6 feet high with long pods."

50232. HETEROPOGON CONTORTUS (L.) Beauv. Poaceæ. **Grass.**

"(No. 576. Albertville. February 12, 1920.) A low grass about a foot high, which grows in dense masses on poor sandy soil."

For previous introduction, see S. P. I. No. 15357.

50233 and 50234. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc. Poaceæ. **Tabucki grass.**

50233. "(No. 568. Albertville. February 10, 1920.) Darker and more hairy than the normal plants of this species, 8 feet high."

50234. "(No. 569. Albertville. February 10, 1920.) Seed collected from many different plants."

50221 to 50287—Continued.

50235 and 50236. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

50235. "(No. 600. Kigoma. February 14, 1920.) A white kafir called mtama, from the market."

50236. "(No. 603. Kigoma. February 14, 1920.) A white kafir (mtama) purchased in the market."

50237. IPOMOEA PES-CAPRAE (L.) Roth. Convolvulaceæ.
(*I. biloba* Forsk.)

"(No. 565. Albertville. February 9, 1920.) From the sandy shore of Lake Tanganyika."

For previous introduction, see S. P. I. No. 47921.

50238. QUAMOCLIT PENNATA (Desr.) Voigt. Convolvulaceæ.

"(No. 549. Kongolo. February 6, 1920. Herb. No. 653.) An ornamental vine."

50239. JATROPHA CURCAS L. Euphorbiaceæ.

"(No. 611. Ujiji. February 17, 1920.) A crotonlike oil plant, the same as No. 459 [S. P. I. No. 50021]. The Belgians are trying to extract the oil here in the Ujiji soap factory."

For previous introduction, see S. P. I. No. 47916.

50240. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

"(No. 548. Kongolo. February 6, 1920.) A small red tomato abundant here; the only tomato in the market."

50241. MANIHOT GLAZIOVII Muell. Arg. Euphorbiaceæ. **Ceara rubber.**

"(No. 612. Ujiji. February 17, 1920.) The rubber tree, also grown as an ornamental or street tree."

For previous introduction, see S. P. I. No. 46809.

50242. NICOTIANA TABACUM L. Solanaceæ. **Tobacco.**

"(No. 558. Kongolo. February 7, 1920.) Native tobacco; very strong but of good aroma."

50243. PACHYLOBUS sp. Balsameaceæ.

"(No. 550. Kongolo. February 7, 1920.) A large forest tree with nuts edible when boiled; the nuts also yield an oil."

50244. PANICUM MAXIMUM Jacq. Poaceæ. **Grass.**

"(No. 544. Kongolo. February 5, 1920. Herb. No. 651.) A large Panicum."

For previous introduction, see S. P. I. No. 47032.

50245. PENNISETUM GLAUCUM (L.) R. Br. Poaceæ. **Pearl millet.**
(*P. typhoideum* Pers.)

"(No. 599. Kigoma. February 14, 1920.) From the market."

For previous introduction, see S. P. I. No. 48095.

50246 and 50247. PENNISETUM SETOSUM (Swartz) L. Rich. Poaceæ. **Grass.**

50246. "(No. 542. Kongolo. February 6, 1920. Herb. No. 648.) A large Setarialike grass, prominent in this region."

50247. "(No. 543. Kongolo. February 6, 1920.) A large grass similar to the previous number [S. P. I. No. 50246], but with larger heads."

50221 to 50287—Continued.

50248 and 50249. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean.**

50248. "(No. 597. Kigoma. February 14, 1920.) A small green bean used by the Arabs."

50249. "(No. 601. Kigoma. February 14, 1920. Herb. No. 668.) A low bush form grown by the natives; seeds and pods very small."

50250 to 50267. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

"(Kigoma. February 14, 1920.) Beans from the region of Usumbura, shipped through Kigoma and sold in the market in Albertville. They constitute one of the staples here."

50250. "(No. 577.) A large white bean."

50251. "(No. 578.) Similar to the navy bean."

50252. "(No. 579.) A greenish yellow bean."

50253. "(No. 580.) A brown bean."

50254. "(No. 581.) A black bean."

50255. "(No. 582.) A brownish yellow bean; striped."

50256. "(No. 583.) Light yellow with dark stripes."

50257. "(No. 584.) Reddish bean with dark stripes."

50258. "(No. 585.) Reddish brown bean."

50259. "(No. 586.) Purple-mottled bean."

50260. "(No. 587.) Purple, red-mottled bean."

50261. "(No. 589.) Deep-red bean, not mottled."

50262. "(No. 590.) Deep-purple bean."

50263. "(No. 591.) Gray bean."

50264. "(No. 592.) Reddish bean with purple stripes."

50265. "(No. 593.) Red bean with white mottling."

50266. "(No. 594.) Reddish tan bean."

50267. "(No. 595.) Unassorted remainder."

50268. PHYSALIS ANGULATA L. Solanaceæ.

"(No. 546. Kongolo. February 6, 1920.) The plants are more glaucous and smaller than those of *Physalis edulis*, and the berries are sweeter."

50269. PISUM SATIVUM L. Fabaceæ. **Garden pea.**

"(No. 596. Kigoma. February 14, 1920.) Sold here in the market; also from the Urumbura region."

50270. RICINODENDRON sp. Euphorbiaceæ.

"(No. 559. Kabalo. February 8, 1920.) The ripe fruit is greenish with a pulp about one-fourth of an inch deep and quite sweet. The pulp is used, but the nut is of the most value, both as food and for oil."

50271 to 50277. RICINUS COMMUNIS L. Euphorbiaceæ. **Castor-bean.**

50271. "(No. 566. Kabalo to Albertville. February 10, 1920.) Castor-bean."

50272. "(No. 604. Ujiji. February 17, 1920.) Small-seeded castor-oil plant; the best oil variety grown here. There is a plant in Ujiji for extracting the oil and plantations for growing the raw material."

50273. "(No. 605. Ujiji. February 17, 1920.) A large-seeded variety similar to No. 609 [S. P. I. No. 50277]."

50221 to 50287—Continued.

50274. "(No. 606. Ujiji. February 17, 1920.) A bean intermediate in size between Nos. 605 and 604."

50275. "(No. 607. Ujiji. February 17, 1920.) A very large reddish tinted castor-bean."

50276. "(No. 608. Ujiji. February 17, 1920.) A large deep-brown bean."

50277. "(No. 609. Ujiji. February 17, 1920.) Mixed castor-beans."

50278. SOLANUM sp. Solanaceæ.

"(No. 545. Kongolo. February 6, 1920. Herb. No. 646.) A Solanum similar to the wonderberry."

50279. TITHONIA ROTUNDIFOLIA (Mill.) Blake. Asteraceæ.
(*T. speciosa* Griseb.)

"(No. 570. Albertville. February 10, 1920.) A peculiar composite which looks like a single dahlia but has mintlike foliage. It is cultivated as an ornamental."

For previous introduction, see S. P. I. No. 43782.

50280 and 50281. TRICHOLAENA ROSEA Nees. Poaceæ. **Natal grass.**

50280. "(No. 561. Kabalo. February 8, 1920.) Abundant on sandy soil."

50281. "(No. 573. Albertville. February 12, 1920.) Growing on sandy soil. It is a foot high and accustomed to long periods of drought."

50282. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

"(No. 551. Kongolo. February 7, 1920.) Small red beans from the native market."

50283. VIGNA sp. Fabaceæ.

"(No. 571. Albertville. February 10, 1920.) A wild vine along the lake shore."

50284 to 50286. ZEA MAYS L. Poaceæ. **Corn.**

50284. "(No. 552. Kongolo. February 7, 1920.) Red flint corn."

50285. "(No. 553. Kongolo. February 7, 1920.) White flint corn."

50286. "(No. 554. Kongolo. February 7, 1920.) White and blue flint corn."

50287. (Undetermined.)

"(No. 574. Albertville. February 12, 1920. Herb. No. 574.) A tree."

50288 to 50306.

From Kew, England. Seeds presented by Sir David Prain, director, Royal Botanic Gardens. Received May 3, 1920.

50288. BERBERIS TISCHLERI C. Schneid. Berberidaceæ. **Barberry.**

A shrub about 2 meters high, with leaves paler beneath, yellow flowers, and yellowish red fruits; native to western Szechwan at altitudes of 2,300 to 3,800 meters. (Adapted from *Sargent, Plantæ Wilsonianæ, vol. 1, p. 355.*)

For previous introduction, see S. P. I. No. 43825.

50289. BETULA ERMANI Champ. Betulaceæ. **Birch.**

A tree up to 100 feet in height, with the bark of the trunk creamy white and peeling, that of the branches orange-brown; native to Manchuria, Korea, and Japan. It is said to be liable to injury by spring frosts, owing to its early start

50288 to 50306—Continued.

into growth. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 256.*)

For previous introduction, see S. P. I. No. 40154.

50290. BETULA KENAICA W. H. Evans. Betulaceæ. **Birch.**

A tree, native to the Alaskan coast from Cook Inlet southward to the head of Lynn Canal, 30 to 40 feet high, with widespreading branches. The stout branchlets are marked with red-brown lenticels becoming darker after 2 or three years. The thin, furrowed bark is dark brown or nearly black near the base of the trunk, grayish white or light reddish brown higher up. The leaves are dull dark green above, pale yellow-green below. (Adapted from *Sargent, Manual of the Trees of North America, p. 205.*)

50291. EUONYMUS USSURIENSIS Maxim. Celastraceæ.

A shrub or small tree with short, thick branches, broadly elliptical leaves, and small flowers with yellow anthers. (Adapted from *Bulletin de L'Académie Impériale des Sciences de St. Pétersbourg, vol. 27, p. 450.*)

50292. PYRACANTHA CRENULATA (Don) Roemer. Malaceæ.
(*Crataegus crenulata* Roxb.)

Variety *rogersiana.*

A very attractive, rapid-growing shrub with an abundance of white flowers in May, followed in October by a profusion of bright-red berries. It is native to the Himalayas and China. (Adapted from *The Garden, vol. 78, p. 563.*)

50293. RUBUS ALLEGHANIENSIS Porter. Rosaceæ. **Blackberry.**
(*R. nigrobaccus* Bailey.)

One of the numerous forms of the cultivated blackberry, often known as *Rubus nigrobaccus*, but apparently only a more or less stable form of *R. alleghaniensis.*

50294. RUBUS BIFLORUS QUINQUEFLORUS Focke. Rosaceæ.

A large vigorous-growing bush with attractive, stout, "whitewashed" stems, 12 to 15 feet in height, and ornamental foliage. This plant produces rich, golden yellow, raspberrylike fruits of pleasant flavor, which may prove of considerable value in the hands of the hybridist. (Adapted from *The Garden, vol. 76, p. 624.*)

For previous introduction, see S. P. I. No. 42586.

50295. RUBUS COREANUS Miquel. Rosaceæ.

An upright-growing Chinese bramble which is self-supporting. The bluish white stems are 7 or more feet in length and are furnished abundantly with handsome pinnate leaves which are about 8 inches long and consist of seven to nine leaflets. The stems are armed with straight prickles; those on the petioles are hooked. The fruits are small, red to nearly black, and edible. Native to central and western China at altitudes of 6,000 feet. (Adapted from *Gardeners' Chronicle, third series, vol. 51, p. 148.*)

For previous introduction, see S. P. I. No. 42585.

50296. RUBUS FLOSCULOSUS Focke. Rosaceæ.

A vigorous Chinese shrub, 10 to 15 feet high, with stout, erect, dark purplish brown stems, smooth except for a few spines. The pinnate leaves, smooth above, are covered beneath with a close white felt. The small pink flowers are followed by small, very dark red or black fruit. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 458.*)

For previous introduction, see S. P. I. No. 29976.

50288 to 50306—Continued.

50297. RUBUS GIRALDIANUS Focke. Rosaceæ.

A vigorous, strikingly handsome Rubus with stout blue-white stems, 12 to 15 feet high. The foliage is decidedly ornamental and the stems are very showy, particularly in winter. (Adapted from *Gardeners' Chronicle, third series, vol. 51, p. 147.*)

For previous introduction, see S. P. I. No. 40594.

50298. RUBUS LASIOSTYLUS Focke. Rosaceæ.

A stout, hardy plant, strikingly ornamental with its thick, very spiny stems, of a peculiar whitened character, 4 to 12 feet high. The pinnate leaves are dark green above and silvery white beneath; when young, the leafstalks and veins are suffused with rose. The magenta red flowers are followed by curious white, woolly fruits which are sweet to the palate and are said to be used for food in China, where it is native. (Adapted from *Gardeners' Chronicle, third series, vol. 51, p. 167*; and *Gardening Illustrated, vol. 28, p. 631.*)

For previous introduction, see S. P. I. No. 44402.

50299. RUBUS MESOGAEUS Focke. Rosaceæ.

A central Chinese bramble with slender climbing stems, 4 to 5 meters long, rather small flowers, and small globose berries. (Adapted from *Focke, Species Ruborum, Bibliotheca Botanica, vol. 72, p. 204.*)

For previous introduction, see S. P. I. No. 42589.

50300. RUBUS NUTKANUS Moc. Rosaceæ.

The salmonberry of Alaska, with large, sweet, pleasant-flavored fruits and no prickles. The plant dies down to the root annually; the seeds may rest for fully 15 years under ground and yet be able to germinate. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 476.*)

50301. RUBUS PARVIFOLIUS L. Rosaceæ.

An East Asian and Australian plant which produces much finer fruit in the mountains of Australia than in the lowlands. It extends as a native to Japan. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 477.*)

For previous introduction, see S. P. I. No. 29978.

50302. RUBUS PHOENICOLASIUS Maxim. Rosaceæ.

A very ornamental Japanese wineberry, 8 to 10 feet high, with the branches and fruit clusters covered with a dark-red hairy pubescence that contrasts delightfully with the green leafage and its white reverse surface. This bramble is remarkably productive and is very decorative with its long full sprays of berries ranging from pale yellow, where the red calyces have but just expanded, to the polished crimson of the ripe berries. The ripe fruit is agreeable in flavor and has a certain sharp, brisk quality in the taste. The plant is as hardy as the raspberry and prefers damp situations. (Adapted from *Gardening Illustrated, vol. 19, p. 235.*)

For previous introduction, see S. P. I. No. 36071.

50303. RUBUS PUBESCENS Weihe. Rosaceæ.

A very robust bramble native to Europe, with strong canes which, however, do not ascend to any considerable height without support. The fruit is well developed and pleasant flavored.

For previous introducton, see S. P. I. No. 42591.

50288 to 50306—Continued.

50304. RUBUS VEITCHII Rolfe. Rosaceæ.

One of the handsomest of all the Chinese brambles. The plants grow to a height of 6 to 7 feet, have blue-white stems and attractive, much-divided fernlike foliage. At first erect, the stems are gracefully drooping with age. Both stems and petioles are very spiny. The pinnate leaves are dark green above and white beneath. The purple flowers are borne in small terminal panicles; the blue-black fruits are of moderate size. (Adapted from *Gardeners' Chronicle, third series, vol. 51, p. 148.*)

50305. RUBUS XANTHOCARPUS Bur. and Franch. Rosaceæ.

A Chinese trailing plant with large, ovate, bright-yellow fruits which are fragrant and palatable.

For previous introduction, see S. P. I. No. 24155.

50306. STAPHYLEA PINNATA L. Staphyleaceæ.

A treelike shrub, widely distributed throughout Europe to western Asia, with deciduous leaves and terminal clusters of small flowers and much-inflated membranaceous podlike fruits. (Adapted from *Gardening Illustrated, vol. 39, p. 476.*)

50307. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From Teteko, New Zealand. Tubers presented by Charles G. Hallett. Received May 11, 1920.

"Tubers of a peculiar potato that grows in this district. I was given one little tuber by a Government overseer of rabbiters who had taken some tubers from the spring in which they grow and had grown them in his garden for a year or so. He assured me that frost does not affect the plants when growing in the spring. The tubers I am forwarding you grew in my garden from the one I received from the rabbiter, so they have been out of the water for two or three generations." (*Hallett.*)

"On the northern side of the Rangitaiki River, in the Bay of Plenty district, opposite the old Maori settlement called Waiohau, where a splendid spring of fresh water issues from the base of a hill and flows between banks heavily fringed with water cress to the near-by river, a remarkable instance of a plant forsaking its normal environment may be observed. There water cress and potato plants flourish together, and tubers are found among the cress roots from 12 to 18 inches under water. Some of the tubers are almost in midstream, others may be found snuggled into the bank fiber, and the foliage of cress and potato mingle on the water surface. It may be that the plants are dependent for their growth upon the earthy particles held by the cress roots and also that there is some fertilizing quality in the water which drains from the great volcanic area. The potatoes when cooked are not all mealy, but waxy. They grow to a fair size and are fit for eating as early as August.

"I forwarded some of the tubers for testing at the Moumahaki Experimental Farm last season. The manager's report on the trial is as follows:

"'Some of the water-potato tubers were planted on August 31, 1916, in the potato-variety trials, having the same treatment, soil, and manured as the 66 other varieties planted on the same date. The potato in question came away vigorously and is distinct in foliage, with a large blue flower, bearing seed apples naturally. The crop was lifted on February 6, 1917, and was free from disease. The yield was as follows: Marketable tubers (table and seed), at the rate of 11 tons per acre; pig potatoes, 1.87 tons; total 12.87 tons. The cooking test made on February 6, by boiling, showed that the potatoes kept their color 24 hours, but they could not be classed as good cookers. The starch content is believed to be high. About the same date one root was lifted, and the tubers were put into running stream water. In less than a month the tubers had rotted.'

"Despite the negative result recorded in the last part of this report, the circumstances surrounding the growth of the tubers in the Rangitaiki spring may indicate, if only slightly, a possible reversion of this long-domesticated plant to an ancestral habit." (*D. M. Ross, New Zealand Journal of Agriculture, vol. 15, p. 209.*)

50308 and 50309.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received May 4, 1920.

50308. IPOMOEA sp. Convolvulaceæ. **Morning-glory.**

"A white-flowered perennial Ipomoea. The plant is of medium growth and blossoms during the winter months, the tourist season." (*Wester.*)

50309. CITRUS HYSTRIX DC. Rutaceæ. **Cabuyao.**

"Seeds of an unusually productive tree; fruits rather more oblate than the ordinary run of this species." (*Wester.*)

For previous introduction, see S. P. I. No. 42364.

50310. IPOMOEA sp. Convolvulaceæ. Morning-glory.

From Coban, Guatemala. Seeds presented by Harry Johnson. Received May 4, 1920.

"A rather vigorous vine not more than 25 feet long in the specimens seen, with leaves 2½ inches in length. The flowers, which are borne in clusters of two or more on 3-inch pedicels, are 2½ inches in diameter, salver shaped, and are a peculiar shade of terra cotta, which is a novel color. It is quite free flowering, and here it is a perennial. I have seen it only in the hot lowlands. Seeds collected at Papalha." (*Johnson.*)

50311. LILIUM PHILIPPINENSE Baker. Liliaceæ. Benguet lily.

From Manila, Philippine Islands. Bulbs presented by M. J. Oteyza, forester in charge of the Baguio district in Benguet, Luzon, through Elmer D. Merrill, director, Bureau of Science. Received May 5, 1920.

A very beautiful hardy white lily with a fragrance indistinguishable from that of a gardenia. The plant is exceedingly dainty, with slender recurving leaves not more than one-fifth of an inch wide. The flowers are 8 inches long with a very slender tube; the segments are spread out only near the apex. The bulbs will flower in less than half the time required to force *Lilium longiflorum.* (Adapted from *Gardeners' Chronicle, third series, vol. 36, p. 210.*)

For previous introduction, see S. P. I. No. 45570.

50312. NICOTIANA TABACUM L. Solanaceæ. Tobacco.

From Smyrna, Turkey. Seeds presented by George Horton, American consul general. Received May 5, 1920.

"Seeds of the Turkish tobacco grown in the region about Smyrna. E. M. Yantis, of the Gary Tobacco Co., states that only one type is grown in this region." (*Horton.*)

50313. CEDRUS ATLANTICA Manetti. Pinaceæ.

From Tangier, Morocco. Seeds presented by Jules Goffart, Société d'Horticulture. Received June 1, 1920.

One of the finest evergreens, of vigorous growth and pyramidal form; it has dense, light silvery foliage. In its native territory, the Atlas Mountains of Algeria, it reaches a height of 120 feet. It thrives splendidly on the Pacific coast of the United States and can be grown in a sheltered position on the Atlantic coast as far north as New York. (Adapted from *Florists' Review, vol. 34, p. 78.*)

50314. LOBELIA NICOTIANAEFOLIA Heyne. Campanulaceæ.

From Manila, Philippine Islands. Seeds presented by Elmer D. Merrill, director, Bureau of Science. Received May 6, 1920.

"The plant is a tall, coarse herb, attaining a height of from 2 to 3 meters, the stem often being 3 centimeters in diameter. It grows on the mountains of northern Luzon at altitudes of 1,500 to 2,000 meters in damp ravines, in open places, and in thickets. The inflorescence is terminal, consisting of numerous pale-blue flowers. The plant has some possibilities as an ornamental on account of its very luxuriant growth." (*Merrill.*)

50315 to 50324. VICIA spp. Fabaceæ.

From Erfurt, Germany. Seeds purchased from Haage & Schmidt. Received May 6, 1920.

A collection of vetch seeds introduced for the Office of Forage-Crop Investigations.

50315. VICIA BITHYNICA L.

An annual upright or climbing vetch, with numerous branching stems 4 to 20 inches long. The leaflets, of which there are from one to three pairs, are lanceolate or even linear, and the rather large flowers have yellowish wings and keels and purple-violet standards which finally become blue. Native to the Mediterranean regions. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, pt. 2, p. 983.*)

50316. VICIA ANGUSTIFOLIA Grufberg.

An annual European vetch 1 to 2 feet long, with nearly sessile leaves made up of 3 to 7 pairs of linear-lanceolate leaflets and bearing purple flowers about half an inch long. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, pt. 2, p. 971.*)

50317. VICIA SATIVA L.

For previous introduction see S. P. I. No. 32195.

50318. VICIA DASYCARPA Ten.

"An annual or sometimes perennial European vetch with slender angled stems, about 10 pairs of ovate to linear leaflets, and flowers which are whitish below and blue-violet above, becoming blue with age. Produces good seed crops." (*P. L. Ricker.*)

For previous introduction, see S. P. I. No. 32165.

50319. VICIA SATIVA L.

Received as *Vicia striata*, but the seeds do not agree with that species.

50320. VICIA SATIVA L.

Received as *Vicia peregrina*, but the specimens do not agree with that species.

50321. VICIA SATIVA L.

Received as *Vicia picta*, but specimens grown from these seeds are *Vicia sativa*.

50322. VICIA ATROPURPUREA Desf.

Received as *Vicia pseudocracca*, but specimens grown from these seeds are *Vicia atropurpurea*.

50323. VICIA SEPIUM L.

A perennial European vetch with climbing, rarely prostrate stems, up to a meter long, terminating in almost threadlike reddish tendrils. The leaflets are oval to elongate, and the flowers, in clusters of two to five, are dark lilac

50315 to 50324—Continued.

colored, more rarely yellowish white or pure white. The black narrow pods are about an inch long. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, pt. 2, p. 953.*)

For previous introduction, see S. P. I. No. 32204.

50324. VICIA SYLVATICA L.

A perennial weak-stemmed vetch from northern and eastern Europe, sometimes over 5 feet high, with mucronate narrow leaflets, whitish flowers with lilac-colored stripes, and elongate, pendent black pods about an inch long. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, pt. 2, p. 925.*)

For previous introduction, see S. P. I. No. 31085.

50325. MIDA ACUMINATA (R. Br.) Kuntze. Santalaceæ. **Quandong.**
(*Fusanus acuminatus* R. Br.)

From Sydney, New South Wales. Seeds presented by the Forestry Commission. Received May 6, 1920.

For previous introduction, see S. P. I. No. 49893.

50326. CITRUS NOBILIS DELICIOSA (Ten.) Swingle. Rutaceæ. **Tangerine.**

From Jhelam, Punjab, India. Budwood presented by Mrs. Ralph R. Stewart. Received May 7, 1920.

"(Jhelam, Punjab. March 11, 1920.) *Naranji* tangerine." (*Stewart.*)

For previous introduction, see S. P. I. No. 45933.

50327. AMORPHOPHALLUS sp. Araceæ.

From Singapore, Straits Settlements. Tuber presented by I. Henry Burkill, director, Botanic Gardens. Received May 7, 1920.

"A tuber of a species of Amorphophallus from the Waterfall Garden in Penang. It came from the Kedah Peak, where *Amorphophallus prainii* may well occur." (*Burkill.*)

50328 to 50331.

From Pancajche, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received May 7, 1920. Quoted notes by Mr. Johnson.

"These blackberries were collected at Tactic, Alta Vera Paz, at altitudes of 5,000 to 6,000 feet."

50328. RUBUS sp. Rosaceæ. **Blackberry.**

"(No. 1. April 13, 1920.) A remarkably fruitful blackberry of vigorous growth, with canes up to an inch in diameter and sharp, hooked spines which are not very numerous. The fruits, which are borne in big terminal clusters of 15 to 35 berries, are of good flavor and rather long. The seeds are not objectionable, as in so many cultivated varieties. These seeds are all from one plant."

50329. RUBUS sp. Rosaceæ. **Blackberry.**

"(No. 2. April 13, 1920.) A vigorous vine; the canes are covered with glandular hairs. It is a medium bearer, with good-sized fruits."

50328 to 50331—Continued.

50330. RUBUS sp. Rosaceæ. **Blackberry.**

"(No. 3. April 13, 1920.) Seeds from many vines of one species. The vines are vigorous and upright, producing canes more than 10 feet high, with few spines. The fruits are of good size and flavor, and the vines are good bearers."

50331. SALVIA sp. Menthaceæ. **Sage.**

"(No. 5. Tactic. April 13, 1920.) A perennial Salvia, rather frequent in the underbrush on the mountain sides above Tactic at altitudes of 5,000 to 6,000 feet. It is soft wooded, producing pendent stems 3 to 5 feet long. The flowers, which are borne in terminal spikes up to a foot long, are bright red, tubular without a widely flaring mouth, and five-eighths of an inch long. The foliage is similar to that of *Salvia splendens*."

50332. GREVILLEA BANKSII R. Br. Proteaceæ.

From Littleriver, Fla. Seeds presented by Charles T. Simpson. Received May 11, 1920.

"These seeds of *Grevillea banksii*, a native of Australia, are from a tree on my grounds. It is one of our best ornamentals, being a rapid, upright grower, with elegant pinnatifid leaves with greenish silvery undersurfaces. It begins to bloom in December and continues in flower until in May, being covered with heads of curious carmine flowers, which are decidedly attractive. The tree is perfectly hardy here and would probably be so for some distance farther north, and so far it is entirely free from insect pests or diseases. It will grow in hammock or pineland with little culture or fertilizer." (*Simpson.*)

For previous introduction, see S. P. I. No. 40042.

50333. LAGENARIA VULGARIS Seringe. Cucurbitaceæ. **Gourd.**

From Avery Island, La. Seeds presented by E. A. McIlhenny. Received May 13, 1920.

"I am sending you a few of the edible gourd seeds. A glance at them will show that they are different from the snake gourd of India. This gourd is thoroughly edible when 3 feet in length if grown under favorable conditions and is then without husk and tender from skin to skin." (*McIlhenny.*)

50334. THEMEDA QUADRIVALVIS (L.) Kuntze. Poaceæ. **Grass.**
(*Anthistiria ciliata* L. f.)

From Hobart, Tasmania. Seeds presented by L. A. Evans, acting director of Agriculture. Received May 13, 1920.

"A coarse, rather tough annual grass which grows in tufts from 1 to 3 feet in height. It is closely related to the kangaroo grass of Australia and Tasmania." (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 48487.

50335. PASPALUM DILATATUM Poir. Poaceæ. **Grass.**

From Sydney, New South Wales. Seeds presented by W. Plant & Co. Received May 14, 1920.

"This grass is a smooth perennial with a deep, strong, root system and grows in clumps 2 to 4 feet high. It is a native of South America and perhaps also of the Gulf States in this country. In Australia this grass has proved to be valuable, especially on the northern coast of New South Wales. It is said to remain green when all other grasses have dried up. Owing to its tendency to lodge, it is better adapted for pasture than for hay. The seed is usually of low percentage of germination." (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 35068.

50336 to 50339.

From Darjiling, India. Seed presented by Lieut. Col. A. T. Gage, through the Lloyd Botanic Garden. Received May 17, 1920, for work on leaf rusts conducted by the Office of Cereal Investigations.

50336. CLEMATIS GOURIANA Roxb. Ranunculaceæ.

An extensive climber, with shining leaves pubescent beneath and yellowish or greenish white flowers in dense panicles. Native to the western Himalayas up to 3,000 feet; also to Ceylon and the Eastern Peninsula. (Adapted from *Hooker, Flora of British India, vol. 1, p. 4.*)

For previous introduction, see S. P. I. No. 47659.

50337. CLEMATIS MONTANA Buch.-Ham. Ranunculaceæ.

A vigorous white-flowered climber, valuable for covering verandas. Native to the Himalayas.

For previous introduction, see S. P. I. No. 39007.

50338. THALICTRUM CHELIDONII DC. Ranunculaceæ.

A very beautiful ornamental plant, 15 inches high, with lovely pale-green foliage pubescent beneath. The delicate, silvery lavender flowers, over an inch across, are borne in graceful sprays. (Adapted from *The Garden, vol. 82, p. 289.*)

50339. THALICTRUM ELEGANS Wall. Ranunculaceæ.

An erect perennial herb with panicles of green-purple flowers. Native to the subalpine Himalayas from Hazara to Sikkim at altitudes of 10,000 to 13,000 feet. (Adapted from *Hooker, Flora of British India, vol. 1, p. 10.*)

50340 to 50342.

From Brisbane, Queensland. Seeds presented by C. T. White, Government botanist. Received May 20, 1920.

50340. ASTREBLA PECTINATA CURVIFOLIA Turner. Poaceæ. **Grass.**

"*Curly Mitchell* grass." (*White.*)

One of the best pasture grasses of Queensland, forming erect tufts 1 to 2 feet high, with narrow, much-curved leaves and woolly spikelets. Seeds of this grass furnished the Queensland aborigines with a large proportion of their food. (Adapted from *Bailey, Queensland Flora, pt. 6, p. 1897.*)

50341. ASTREBLA TRITICOIDES (Lindl.) F. Muell. Poaceæ. **Grass.**

A strong-growing somewhat wiry perennial grass that grows on stiff clayey soil. Its flowering spikes, resembling heads of wheat, are said to have highly fattening qualities and are readily eaten by stock. Native to South Australia, New South Wales, and Queensland. (Adapted from *Maiden, Useful Native Plants of Australia, p. 78.*)

For previous introduction, see S. P. I. No. 48977.

50342. PANICUM DECOMPOSITUM R. Br. Poaceæ. **Grass.**

A spreading glabrous grass, 2 to 3 feet high, common in Queensland. The pounded grains are said to yield a good food, although the grains are rather small. It is excellent for fodder.

For previous introduction, see S. P. I. No. 45040.

50343. ZIZIPHUS SPINA-CHRISTI (L.) Willd. Rhamnaceæ.

From Algiers, Algeria. Seed presented by Dr. L. Trabut. Received May 21, 1920.

A large tree, cultivated as an ornamental in the oases and gardens of the Sudan, with bright-green leaves somewhat fleshy and cordate and ovoid, fragrant, red-brown fruit. The red wood is used by the natives for coarse carpentry. (Adapted from *Bulletin de la Société de Horticulture de Tunis, vol. 17, p. 125.*)

For previous introduction, see S. P. I. No. 44361.

50344. VACCINIUM VITIS-IDAEA L. Vacciniaceæ. **Red bilberry.**

From Stockholm, Sweden. Fruits presented by Dominic I. Murphy, American consul general. Received May 14, 1920.

A small bush, seldom more than 7 or 8 inches in height, which grows wild in northern Europe. The leaves are evergreen, and the blossoms are white or pink. The deep-red berries have a tart, sour taste and are a reasonable substitute for cranberries. The shrub grows best upon the heathery moors, in light forest growths, and on the lower hills of the mountainous districts. (Adapted from *Commerce Reports, November 28, 1910.*)

A form, *Vaccinium vitis-idaea* var. *minor*, of this plant grows in the extreme northeastern United States and in Canada; it is here known as the mountain or rock cranberry.

50345. ANDROPOGON sp. Poaceæ.

From Kisantu, Belgian Kongo. Seeds presented by Father H. Vanderyst. Received July 29, 1920.

50346. ALLIUM CEPA L. Liliaceæ. **Onion.**

From Valencia, Spain. Seeds presented by John R. Putnam, American consul. Received May 22, 1920.

For use in horticultural and pomological investigations.

50347 and 50348.

From Kulare, via Cairns, Queensland, Australia. Seeds presented by J. A. Hamilton. Received May 4, 1920.

50347. EUCALYPTUS TERETICORNIS J. E. Smith. Myrtaceæ.

This tree is usually not more than 100 feet high in Australia. It grows best near the coast, but endures the dry heat of the interior valleys. The trees of this species furnish an excellent red timber which is very hard and durable. (Adapted from *McClatchie, Eucalypts Cultivated in the United States, Bulletin 35, U. S. Bureau of Forestry, p. 81.*)

For previous introduction, see S. P. I. No. 38728.

50348. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean.**

According to Mr. Hamilton these beans are there known as "green soy beans."

50349 to 50351. AVENA SATIVA L. Poaceæ. **Oats.**

From Bremen, Germany. Presented by Prof. S. Tacke, director, Moor-Versuchs-Station. Received May 18 and 20, 1920. Quoted notes by Professor Tacke.

50349. "Bright-yellow oats."

50350. "Black-speckled oats."

50351. "Golden yellow oats."

50352. CREPIS BREVIFLORA Delile. Cichoriaceæ.

From Cairo, Egypt. Seeds presented by Thomas W. Brown, director, Horticultural Section, Gizeh Branch, Ministry of Agriculture. Received May 21, 1920.

An Egyptian annual, 50 centimeters to 1 meter high, with a slender, zigzag, dichotomous, corymbose stem. The lower leaves are ovate-oblong, and the stem leaves are linear lanceolate with sagittate bases. The heads of yellow flowers are very small. (Adapted from *Muschler, Manual Flora of Egypt, p. 1067.*)

This genus forms an unusually promising subject for genetic research, and these seeds were introduced for purposes of comparison and experimental breeding at the University of California Agricultural Experiment Station.

50353. ALEURITES MONTANA (Lour.) Wilson. Euphorbiaceæ. **Mu-oil tree.**

From Port Louis, Mauritius. Seeds presented by G. Regnard. Received June 8, 1920.

The *mu-yu shu* [mu-oil or wood-oil tree], an ornamental tree cultivated for its oil in subtropical southeastern China. In spring it is a beautiful sight, resembling a plum tree in full flower. The flowers are white with pink and yellow markings. The deciduous leaves are broadly ovate and heart shaped at the base. The fruit is egg shaped, 5 to 6 centimeters (about 2 inches) long, with three longitudinal and many transverse much-raised ridges; the interior part of the fruit is thick and woody and is not easily rotted by fermentation. It incloses usually three obovoid seeds each about 3 centimeters long, warty outside. When ripe, the fruit opens from the base upwards into three parts, and the seeds can then be readily extracted and crushed for oil. This oil is largely used in the paint and varnish industries. (Adapted from *Bulletin of the Imperial Institute, vol. 11, p. 441,* and *Agricultural Gazette of New South Wales, vol. 29, p. 437.*)

For previous introduction, see S. P. I. No. 36897.

50354 to 50356.

From the island of Guam. Seed presented by Glen Briggs, agronomist, Guam Agricultural Experiment Station, through Prof. C. V. Piper. Received May 6, 1920.

50354. ALYSICARPUS VAGINALIS (L.) DC. Fabaceæ.

"This is probably the same as S. P. I. No. 26786. It proved to be the most promising species of Alysicarpus of all those in our trials and for a time promised to be an exceedingly valuable introduction. For some reason not clear the plant failed after the first year or two, but its general character is such that it is worthy of extensive testing to ascertain if possible the exact conditions which it requires." (*Piper.*)

For previous introduction, see S. P. I. No. 26786.

50355. CHRYSOPOGON ACICULATUS (Retz.) Trin. Poaceæ. **Lovi-lovi grass.**

"This grass is abundant in the Indo-Malay region. At Hongkong it is used extensively for lawns. In the Philippines and India it furnishes a good deal of native pasturage, but is objectionable from the fact that when it is allowed to fruit the fruits are sharp pointed, like needles, and so cause some injury to the animals. Besides, they are a nuisance in sticking in the clothing. We have experimented with it somewhat in Florida, where it succeeds well enough, but thus far it has not proved to be aggressive." (*Piper.*)

For previous introduction, see S. P. I. No. 37567.

50354 to 50356—Continued.

50356. TERAMNUS LABIALIS (L.) Spreng. Fabaceæ.

"This is a slender leguminous vine abundant both in the West Indies and East Indies, of possible value as a cover crop in orchards. Recent investigations have shown pretty clearly that the East Indian and West Indian species are distinct, a matter upon which I understand E. D. Merrill expects to publish. If this conclusion is valid, the oriental species will be *Teramnus uncinatus*, while the West Indian species will remain *T. labialis*." (*Piper.*)

For previous introductions, see S. P. I. No. 30716.

50357. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From San Jose, Costa Rica. Tubers presented by Benjamin F. Chase, American consul. Received May 1, 1920.

"*Papa amarilla*, Italian potato, with yellow flesh." (*Chase.*)

50358. ZEA MAYS L. Poaceæ. **Corn.**

From Honolulu, Hawaii. Seed presented by J. M. Westgate, agronomist in charge, Agricultural Experiment Station. Received May 26, 1920.

"Guam seed corn." (*Westgate.*)

50359 to 50373.

From Darjiling, India. Seeds presented by G. H. Cave, curator, Lloyd Botanic Garden. Received May 20, 1920.

50359. ACER CAMPBELLII Hook. f. and Thoms. Aceraceæ. **Maple.**

The chief maple of the northeastern Himalayas up to 7,000 feet. A large tree, freely reproduced by seed or coppice, with pale close-grained wood which is particularly valuable for planking. (Adapted from *Mueller, Useful Native Plants of Australia, p. 14.*)

For previous introduction, see S. P. I. No. 48024.

50360. ACER LAEVIGATUM Wall. Aceraceæ. **Maple.**

A handsome maple from the northeastern Himalayas up to 7,000 feet, the wood of which is much used for building and for tea boxes. (Adapted from *Mueller, Useful Native Plants of Australia, p. 14.*)

For previous introduction, see S. P. I. No. 47631.

50361. ACER THOMSONI Miquel. Aceraceæ. **Maple.**

A large, handsome tree with thin gray bark, native to the Sikkim Himalayas and Bhutan at altitudes of 7,000 to 9,000 feet. The leaves, 3½ to 10 inches long and wide, are small lobed, and the fruits are 2 to 3 inches long. The soft wood is grayish white. (Adapted from *Hooker, Flora of British India, vol. 1, p. 695,* and *Gamble, A Manual of Indian Timbers, p. 99.*)

50362. ASTILBE RIVULARIS Buch.-Ham. Saxifragaceæ.

A perennial herbaceous plant native to Nepal and the temperate regions of the Himalayas from Kashmir to Bhutan. This species has creeping rhizomes and large radical leaves which are biternately divided into dentate sections and have the leafstalks furnished with numerous tawny hairs. The flowering stems, which attain a height of nearly 5 feet, bear a few alternate leaves and terminate in a remarkably effective, slightly nodding panicle of numerous small flowers. The corolla is wanting and the lobes of the calyx, four or five in number, are yellowish white; the 8 to 10 stamens are pure white. (Adapted from *The Garden, vol. 48, p. 355.*)

For previous introduction, see S. P. I. No. 47643.

50359 to 50373—Continued.

50363. CRACCA CANDIDA (DC.) Kuntze. Fabaceæ.
(*Tephrosia candida* DC.)

A shrub which attains a height of about 10 or 12 feet. It makes a great deal of soft growth and covers the ground well. This shrub has been very well reported on in the East and in various parts of the West Indies. A characteristic feature is its long taproot. (Adapted from *Proceedings of the Agricultural Society of Trinidad and Tobago, vol. 12, p. 256.*)

For previous introduction, see S. P. I. No. 47666.

50364. DOCYNIA INDICA (Wall.) Decaisne. Malaceæ.

A small erect tree with yellowish bark and spreading branches. The sparse glabrous ovate leaves are 2 to 3 inches long. The white flowers, three or four in a single umbel, with hairy calyxes, are followed by smooth, roundish, greenish yellow fruits with orange-colored spots. The flavor of the fruit somewhat resembles that of the quince. (Adapted from *Wallich, Plantae Asiaticae Rariores, vol. 2, p. 173.*)

50365. ECHINOLAENA POLYSTACHYA H. B. K. Poaceæ. **Grass.**

A perennial grass with decumbent straggling stems branched below into leafy slender branches 4 to 18 inches long, native to the eastern Himalayas from Nepal to Sikkim at altitudes of 3,000 to 6,000 feet. The ovate-lanceolate, flat, membranous leaves are 2 to 4 inches long. (Adapted from *Hooker, Flora of British India, vol. 7, p. 59.*)

50366. FRAXINUS FLORIBUNDA Wall. Oleaceæ. **Ash.**

A large tree, leafless during part of winter, found locally in groups in shady parts of mixed forests in Afghanistan, Kandahar, and rarely in the Sikkim Himalayas to a height of 11,000 feet. The finest specimens in the northwestern Himalayas are those planted near villages and temples and on the Chenab, some of which are exceedingly handsome trees, 120 feet high with a thick-based, tall, erect trunk. The cinereous bark is smooth, but with deep longitudinal cracks and transverse furrows. The wood is similar to that of the English ash, tough and hard and much valued for plows, and in Kashmir is reckoned the best wood for oars. (Adapted from *Brandis, Forest Flora of India, p. 302.*)

For previous introduction, see S. P. I. No. 47687.

50367. HYDRANGEA ROBUSTA Hook. f. and Thoms. Hydrangeaceæ.

A very robust species with cordate leaves, deeply and closely toothed and fimbriated, and generally with winged petioles. The pedicels are red; the broadly ovate, white, sinuate, acutely toothed sepals are faintly veined with red-purple. The small perfect flowers have blue petals and stamens. (Adapted from *Curtis's Botanical Magazine, pl. 5038.*)

For previous introduction, see S. P. I. No. 47694.

50368. INDIGOFERA DOSUA Buch.-Ham. Fabaceæ. **Indigo.**

A low shrub with woody branches, clothed with a short gray or brownish pubescence. The leaves, 1 to 3 inches long, bear leaflets one-fourth to half an inch long, which are dull green above, glaucous below. The racemes of bright-red flowers are 1 to 3 inches long with lanceolate-cuspidate silky bracts. (Adapted from *Hooker, Flora of British India, vol. 2, p. 102.*)

For previous introduction, see S. P. I. No. 43776.

50369. INDIGOFERA DOSUA TOMENTOSA Baker. Fabaceæ. **Indigo.**

A shrub of the temperate central and eastern Himalayas at altitudes of 6,000 to 8,000 feet, with its branches clothed with silky pubescence. The leaves are 6 to 9 inches long, composed of 41 to 51 leaflets 1 inch long. The racemes are

50359 to 50373—Continued.

over 3 inches long; the bracts are densely brown velvety, with a very long rigid point. The flowers are said to be eaten in Kangra as a potherb. This shrub is prized as a fodder for sheep and goats. (Adapted from *Hooker, Flora of British India, vol. 2, p. 102*, and *Watt, Dictionary of the Economic Products of India, vol. 4, p. 385.*)

50370. PHOTINIA sp. Malaceæ.

Received as *Photinia integrifolia*, but the seeds do not agree with a previous sample from the same source.

50371. PUERARIA PEDUNCULARIS (Benth.) R. Grah. Fabaceæ.

A copiously twining plant with slender branches clothed with short deflexed deciduous hairs. The membranous green leaflets are gray with a thick down. The reddish flowers with a deep purple tipped keel are in moderately close racemes 6 inches to 1 foot in length. Native to the temperate regions of the eastern Himalayas, Khasi Hills, Nepal, Sikkim, and Mishmi, at altitudes of 5,000 to 9,000 feet. (Adapted from *Hooker, Flora of British India, vol. 2, p. 197.*)

50372. THEMEDA GIGANTEA VILLOSA (Poir.) Hack. Poaceæ. **Grass.**

A stout grass 8 to 16 feet high, with glabrous or scaberulous branches and branchlets, linear leaves 4 to 8 feet long, and a large decompound panicle. Native to Assam, the Khasi Hills, Java, and Malacca. (Adapted from *Hooker, Flora of British India, vol. 7, p. 217.*)

50373. TRACHYCARPUS MARTIANUS (Wall.) Wendl. Phœnicaceæ. **Palm**

A tall, slender tree, 40 to 50 feet high, stunted on dry ground or in otherwise unfavorable localities, with a globose crown of dark shining leaves. The trunk below the crown is clothed with a network of brown fibrous rhomboid meshes formed by the sheathing bases of the 3-foot petioles. The blade is roundish, consisting of 30 to 40 linear segments, 15 to 20 inches long, joined for half their length, emarginate at the top. The drooping compound panicle bears only one berry, which is oblong, yellow at first, dark glossy blue when ripe. The fruit is eaten, though the pulp is scanty and almost tasteless. (Adapted from *Brandis, Forest Flora of India, p. 546.*)

For previous introduction, see S. P. I. No. 48281.

50374 and 50375. SACCHARUM OFFICINARUM L. Poaceæ.

Sugar cane.

From Coimbatore, South India. Cuttings presented by T. S. Venkatraman, Agricultural College. Received May 27, 1920.

"Indigenous Indian canes of the type of the Japanese forage cane which seems to be immune to the mosaic disease, which apparently attacks more or less severely all other sugar-cane types." (*C. O. Townsend.*)

50374. "*Shamsara.* A hardier variety than the following one, chiefly grown in North India, green when young, turning greenish brown at maturity. It yields in northern India 15 to 20 tons in cane, with 16 to 17 per cent sucrose in the juice, and a purity ranging from 80 to 85 per cent. It matures in 10 months. Probably an introduction into this country." (*Venkatraman.*)

50375. "*Vellai.* A thick, juicy cane of South India, green or greenish yellow when young, turning golden yellow at maturity. It yields 20 to 25 tons in cane, with 17 to 18 per cent sucrose in the juice, and a purity ranging from 85 to 90 per cent. It requires 12 to 14 months to mature, is rather delicate, requires careful cultivation, and can not stand water-logging. Not an indigenous cane, but apparently introduced into this country about a century ago." (*Venkatraman.*)

50376 and 50377.

From Gatun, Canal Zone. Seeds presented by Sergt. G. E. Hardwick, Quartermaster Corps. Received May 10, 1920.

50376. CARICA PAPAYA L. Papayaceæ. **Papaya.**

"A very large papaya, which, however, is not sweet. I have never seen one as large in Cuba or the neighboring islands." (*Hardwick.*)

50377. VIGNA SESQUIPEDALIS (L.) Fruwirth. Fabaceæ. **Yard-Long bean.**

"One pod was 37½ inches long." (*Hardwick.*)

50378. HOLCUS SORGHUM L. Poaceæ. Sorghum.

(*Sorghum vulgare* Pers.)

From Teheran, Persia. Plant material presented by Amir Aalam, Minister of Agriculture, Commerce, and Public Works, who obtained it from Amid-ol-Molk, Government agricultural representative in Mazenderan. Received May 22, 1920. Quoted notes by Amid-ol-Molk.

"Seed of *Tani* sugar cane (*nei shakar tani*). The stalk is not higher than 4 feet. This cane is very delicate and can not stand drought. In case no rain falls within one month after the cuttings are planted, they must be irrigated to prevent their spoiling by drying out. The sugar from this sorghum is sweeter than that from the Indian sugar cane (*nei shakar hendi*). A sort of candy is made out of the juice. Red sugar (*shakar ghermez*), which is quite well known in Persia, is extracted from this cane. It is quite evident, however, that if the juice is perfectly purified it will turn white and crystallize."

50379. CASIMIROA EDULIS La Llave. Rutaceæ. White sapote.

Plants grown at the Miami Plant-Introduction Garden from seeds presented by F. O. Popenoe, West India Gardens, Altadena, Calif. Numbered June 8, 1919.

"Seeds from a tree at Sierra Madre. This is a fairly large fruited form and a heavy bearer." (*F. O. Popenoe.*)

50380 and 50381.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received May 26, 1920.

50380. GARCINIA sp. Clusiaceæ.

[Apparently sent by mistake, as the label is Zalacca, which is a palm.]

50381. PROSOPIS VIDALIANA Naves. Mimosaceæ. **Aroma.**

"A tall, spiny shrub of rapid growth, with long, arching branches, found growing on the beach. The plant grows luxuriantly on poor, sandy land and is of fair value as a sand binder. Properly trimmed it is an attractive ornamental shrub that should be of value in extreme southern Florida. If sufficiently hardy it would make a pretty good 'live' fence." (*Wester.*)

For previous introduction, see S. P. I. No. 42807.

50382 to 50387.

From Foochow, Fukien, China. Seeds collected by C. R. Kellogg. Received May 27, 1920. Quoted notes by Mr. Kellogg.

50382. ARACHIS HYPOGAEA L. Fabaceæ. **Peanut.**

"Sixty-day peanuts from Kuliang."

50383. CANAVALI GLADIATUM (Jacq.) DC. Fabaceæ. **Sword bean.**

"Knife bean, with a pod 12 inches long."

50382 to 50387—Continued.

50384. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean.**

"Small green pea from Futsing."

50385. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

"Yellow bean from Hokchiang (Futsing)."

50386. VIGNA SESQUIPEDALIS (L.) Fruwirth. Fabaceæ. **Yard-Long bean.**

"Black bean from Futsing."

50387. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

"Red bean from Futsing."

50388. MANIHOT ESCULENTA Crantz. Euphorbiaceæ. **Cassava.**
(*M. utilissima* Pohl.)

From Bahia, Brazil. Cuttings presented by Dr. V. A. Argollo Ferrão. Received May 27, 1920.

"A very curious and interesting variety from the highlands of the interior. It is called *manioc of 10 years*, because it may remain 10 years in the ground and produce roots that weigh more than 500 kilograms (1,102.3 pounds) on one tree, if they are planted from 10 to 12 meters apart. The roots are very long. It is interesting for countries where there is no frost and where droughts may occur from time to time." (*Argollo Ferrão.*)

50389. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Santiago de las Vegas, Cuba. Cuttings presented by Dr. Mario Calvino, director, Agricultural Experiment Station. Received May 29, 1920.

The *Cristalina* variety of sugar cane for trial in connection with the sugar-cane work of the United States Department of Agriculture.

50390. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Rio Piedras, Porto Rico. Cuttings presented by Prof. F. S. Earle, Insular Experiment Station. Received May 24, 1920.

"*Kavangire* seed cane grown from that received from Argentina last summer." (*Earle.*)

50391 to 50394.

From Montevideo, Uruguay. Seeds presented by Luis Guillot, Dirección General de Paseos Públicos. Received May 19, 1920.

50391. CLEMATIS MONTEVIDENSIS Spreng. Ranunculaceæ. **Clematis.**

A very attractive clematis found in thickets in various parts of Uruguay, especially near the town of Salto, where it climbs trees and shrubs. The large whitish yellow flowers are about 2 centimeters (four-fifths of an inch) in diameter and are borne in axillary and terminal clusters. The ashy green leaves are either entire or more or less three lobed. (Adapted from *Arechavaleta, Flora Uruguaya, vol. 1, p. 24.*)

50392. EUGENIA GLAUCESCENS Cambess. Myrtaceæ.

A large shrub, native to southern Brazil, with rather short, lanceolate leaves up to 2½ inches in length and small white flowers borne singly in the axils of the leaves. (Adapted from *St. Hilaire, Flora Brasiliae Meridionalis, vol. 2, p. 368.*)

50391 to 50394—Continued.

50393. EUPATORIUM OBLONGIFOLIUM (Spreng.) Baker. Asteraceæ.

A tall, smooth, somewhat shrubby composite, native to southern Brazil and Uruguay, where it is called *yerba lagarto*. The unbranched stems, which are almost free of leaves in the upper part, become 2 feet or more high and bear a terminal corymb of red flowers. (Adapted from *Arechavaleta, Flora Uruguaya, vol. 3, p. 161.*)

50394. MIKANIA AMARA (Vahl) Willd. Asteraceæ.

A shrubby climber, found in woods along rivers in Uruguay, where it is called guaco. It has oblong, coriaceous leaves and clusters of whitish flowers. (Adapted from *Arechavaleta, Flora Uruguaya, vol. 8, p. 171.*)

50395 to 50398.

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, in charge, department of botany and forestry, Hawaiian Sugar-Planters' Experiment Station. Received May 24, 1920.

50395. ALTINGIA EXCELSA Noronha. Hamamelidaceæ.

A lofty deciduous tree native to Assam and Tenasserim, with smooth, light-gray bark peeling off in large thin flakes. The soft wood, reddish gray with lighter streaks, is used in Assam for building and ordinary domestic purposes. (Adapted from *Gamble, Manual of Indian Timbers, p. 175.*)

50396. FICUS INVOLUCRATA Blume. Moraceæ. **Fig.**

A tree with oval, obtuse, smooth, parchmentlike leaves 5 to 7 inches long on petioles 1 to 1½ inches long and subglobose fruits. (Adapted from *Blume, Bijdragen tot de Flora van Nederlandsch Indië, p. 447.*)

50397. FICUS RIBES Reinw. Moraceæ. **Fig.**

A small tree with membranous lanceolate leaves 2 to 5 inches long. The receptacles rise from elongated leafless branches which issue from the stem near the ground. The male-flower perianth consists of two large inflated roundish pieces. The gall flowers have a broad ovary and no perianth. The fertile female flowers are on separate receptacles, the tubular perianth covering only the pedicel of the achene. A good tonic is made from the bark which, like the seeds and fruit, is possessed of valuable emetic properties. (Adapted from *Kirtikar, Indian Medicinal Plants, vol. 2, p. 1199.*)

50398. FICUS VARIEGATA Blume. Moraceæ. **Fig.**

A tall spreading tree with pale bark and cordate leaves 4 to 7 inches long, glabrous above. The receptacles, clustered on tubercles of the trunk and branches, are smooth, globose, 1 inch in diameter, and red when ripe, with white streaks and dots. Native to Chittagong, Assam, and Penang. (Adapted from *Hooker, Flora of British India, vol. 5, p. 535.*)

50399 to 50402.

From Ventimiglia, Italy. Seeds presented by Joseph Benbow, superintendent, La Mortola. Received May 24, 1920.

50399. DODONAEA THUNBERGIANA Eckl. and Zeyh. Sapindaceæ.

Zand Olyf. A resinous shrub native to South Africa, with viscid shining coriaceous leaves and short racemes or panicles of greenish flowers. It is frequent on the hillocks from the Fish River westward and on the mountains in the southwest and west. A decoction of the root is used as a slight purgative in cases of fever. (Adapted from *Sim, The Forests and Forest Flora of Cape Colony, p. 173, pl. 26.*)

For previous introduction, see S. P. I. No. 44536.

50399 to 50402—Continued.

50400. DODONAEA TRIQUETRA Wendl. Sapindaceæ.

A tall, erect, glabrous shrub from Australia, with oval-elliptic leaves 2 to 4 inches long and very smooth shining-brown seeds in medium-sized capsules. The wood is light colored and close grained. (Adapted from *Maiden, Useful Native Plants of Australia, p. 417*, and *Bentham, Flora Australiensis, vol. 1, p. 474.*)

For previous introduction, see S. P. I. No. 10493.

50401. RUBUS ULMIFOLIUS Schott. Rosaceæ. **Bramble.**

A vigorous European shrub with more or less plum-colored arching stems clothed with starry down and armed with long, broad-based prickles. The leaves are slightly downy above and white felted beneath. The showy cylindrical panicles of bright rosy red flowers are followed by small dryish fruits. Several ornamental garden varieties have been obtained from this species.

For previous introduction, see S. P. I. No. 40787.

50402. SMILAX ASPERA L. Smilacaceæ. **Smilax.**

A graceful climber native to the Mediterranean basin. It climbs mainly by the aid of stem prickles, but the backs and edges of the leaves are also prickly, helping to sustain the plant as it scrambles over rocks and bushy growths. The form of the leaf, though usually that of a broad lance head with distinct shoulders, is extremely variable both in size and shape; it is sometimes like a wild ivy or Convolvulus leaf. The leaves are sometimes spotted with dull white markings. This pretty plant bears axillary spikes of small, fragrant whitish flowers which are followed by red currantlike fruits. Its near relative [*Smilax officinalis*] of the tropical regions of Central America and the West Indies yields the sarsaparilla of medicine. (Adapted from *The Garden, vol. 62, p. 397.*)

50403 to 50435.

From Jamaica Plain, Mass. Seeds presented by Prof. C. S. Sargent, Arnold Arboretum. Received May 25, 1920.

"Collected in northern Honan by Joseph Hers." (*Sargent.*)

50403. ACTINIDIA PURPUREA Rehder. Dilleniaceæ.

"(No. 1265.)"

50404. BERBERIS POIRETI C. Schneid. Berberidaceæ. **Barberry.**

"(No. 982.)"

50405. BERBERIS sp. Berberidaceæ. **Barberry.**

"(No. 1160.)"

50406. CELASTRUS LOESENERI Rehd. and Wils. Celastraceæ.

"(No. 828.)"

50407. CELASTRUS sp. Celastraceæ.

"(No. 1287.)"

50408. CELTIS KORAIENSIS Nakai. Ulmaceæ. **Hackberry.**

"(No. 1071.)"

50409. CORNUS sp. Cornaceæ.

"(No. 70.)"

50410. CORNUS WALTERI Wangerin. Cornaceæ.

"(No. 946.)"

50403 to 50435—Continued.

50411. CORNUS POLIOPHYLLA Schneid. and Wang. Cornaceæ.
"(No. 1308.)"

50412. COTONEASTER ZABELI C. Schneid. Malaceæ.
"(No. 1194.)"

50413. COTONEASTER ZABELI C. Schneid. Malaceæ.
"(No. 1379.)"

50414. CRATAEGUS sp. Malaceæ. **Hawthorn.**
"(No. 942.)"

50415. CRATAEGUS sp. Malaceæ. **Hawthorn.**
"(No. 1332.)"

50416. DALBERGIA HUPEANA Hance. Fabaceæ.
"(No. 1359.)"

50417. EUONYMUS sp. Celastraceæ.
[No number.]

50418. EUONYMUS GIRALDII Loes. Celastraceæ.
"(No. 1145.)"

50419. GREWIA PARVIFLORA Bunge. Tiliaceæ.
"(No. 1358.)"

50420. ILEX sp. Aquifoliaceæ.
"(No. 1201.)"

50421. LONICERA sp. Caprifoliaceæ. **Honeysuckle.**
"(No. 1358.)"

50422. MALUS sp. Malaceæ.
"(No. 912.)"

50423. MALUS THEIFERA Rehder. Malaceæ.
"(No. 1115.)"

50424. RHAMNUS sp. Rhamnaceæ.
"(No. 1155.)"

50425. RHAMNUS sp. Rhamnaceæ.
[No number.]

50426. RHAMNUS sp. Rhamnaceæ.
"Small-leaved."

50427. ROSA BANKSIOPSIS Baker. Rosaceæ. **Rose.**
"(No. 896.)"

50428. ROSA sp. Rosaceæ. **Rose.**
[No number.]

50429. SMILAX DISCOTIS CONCOLOR Norton. Smilacaceæ. **Smilax.**
"(No. 1212.)"

50430. SMILAX sp. Smilacaceæ. **Smilax.**
[No number.]

50431. MALUS THEIFERA Rehder. Malaceæ.
"(No. 1161.)"

50432. TILIA sp. Tiliaceæ. **Linden.**
"(No. 1068.)"

50403 to 50435—Continued.

50433. VIBURNUM sp. Caprifoliaceæ.

"(No. 1162.)"

50434. VIBURNUM SHENSIANUM Maxim. Caprifoliaceæ.

"(No. 1326.)"

50435. RHAMNUS sp. Rhamnaceæ.

"(No. 1368.)" Received as *Ilex* sp.

50436 to 50441.

From Foochow, Fukien, China. Seeds collected by C. H. Riggs at Shaowu Agricultural Experiment Station, Shaowu, Fukien; presented through C. R. Kellogg. Quoted notes by Mr. Riggs. Received May 26, 1920.

50436. CACARA EROSA (L.) Kuntze. Fabaceæ. **Yam bean.**
(*Pachyrhizus angulatus* Rich.)

"*De kua* (earth melon). A field crop in any soil; sandy soil is preferred."

For previous introduction, see S. P. I. No. 47146.

50437. CITRULLUS VULGARIS Schrad. Cucurbitaceæ. **Watermelon.**

"*Beh je kua siou* (small white 'only' watermelon). A small white watermelon raised for the seed only, hence called 'only melon.' Flavor poor to medium. Vines short and quite prolific; will yield 10 to 15 bushels of seed per acre."

50438. FAGOPYRUM VULGARE Hill. Polygonaceæ. **Buckwheat.**
(*F. esculentum* Moench.)

"*Kiau ma* (buckwheat). Only type of buckwheat known here."

50439. SESAMUM ORIENTALE L. Pedaliaceæ. **Sesame.**

"*Moi* (sesame). A very common field crop here. Usually planted in gardens or on land not adapted to rice. Best in medium clay loam."

50440 and 50441. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

50440. "*Deu tz* (bean). The only yellow soy bean known here and the one referred to when beans are spoken of unless some other variety is definitely mentioned. A field crop; clay preferred. Usually planted right after rice is reaped, making a rotation of rice in the spring and beans in the fall."

50441. "*U deu* (black bean). The only other type of soy bean grown here. Rather heavier yielder and more vine than the yellow, but not grown very much. A field crop preferring medium-heavy clay soil. Collected at the farm of Lee U. Ken."

50442 to 50465.

From Peking, Chihli, China. Seed presented by N. H. Cowdry, Department of Anatomy, Peking Union Medical College. Received May 26, 1920. Quoted notes by Mr. Cowdry.

50442. APIUM GRAVEOLENS L. Apiaceæ. **Celery.**

"Celery seed."

50443. BETA VULGARIS L. Chenopodiaceæ. **Beet.**

"Beet seed."

50442 to 50465—Continued.

50444 to 50449. BRASSICA PEKINENSIS (Lour.) Gagn. Brassicaceæ. **Pai ts'ai.**

50444. "Oil cabbage seed."
50445. "Red cabbage seed."
50446. "Flat cabbage seed."
50447. "Blue cabbage seed."
50448. "Ordinary Chinese cabbage seed."
50449. "Cabbage seed."

50450. BRASSICA RAPA L. Brassicaceæ. **Turnip.**

"Turnip seed."

50451. CHRYSANTHEMUM CORONARIUM L. Asteraceæ.

Sent in as Sagittaria seed.

50452. CORIANDRUM SATIVUM L. Apiaceæ. **Coriander.**

For previous introduction, see S. P. I. No. 26448.

50453. FOENICULUM VULGARE Hill. Apiaceæ. **Fennel.**

For previous introduction, see S. P. I. No. 35634.

50454. GYMNOCLADUS CHINENSIS Baill. Cæsalpiniaceæ.

"Large black seed."

50455. LACTUCA SATIVA L. Cichoriaceæ. **Lettuce.**

For previous introduction, see S. P. I. No. 47148.

50456. PERILLA FRUTESCENS (L.) Britton. Menthaceæ. **Perilla.**

For previous introduction, see S. P. I. No. 45265.

50457. PISUM SATIVUM L. Fabaceæ. **Garden pea.**

For previous introduction, see S. P. I. No. 48783.

50458 to 50465. RAPHANUS SATIVUS L. Brassicaceæ. **Radish.**

50458. "Big red radish."
50459. "Red radish."
50460. "Radish seed."
50461. "Green radish."
50462. "Green radish with red interior."
50463. "Red radish."
50464. "Large red radish."
50465. "Green radish."

50466 to 50517.

From Para, Brazil. Presented by Sr. André Goeldi, Museu Goeldi. Received June 1, 1920. Quoted notes by Sr. Goeldi.

50466. ACHRAS ZAPOTA L. Sapotaceæ. **Sapodilla.**

Plants of the best of the sapotaceous fruits. It is common in many parts of tropical America and is cultivated successfully in southern Florida, where it merits commercial exploitation.

For previous introduction, see S. P. I. No. 48596.

50467. ACROCOMIA SCLEROCARPA Mart. Phœnicaceæ. **Macaúba palm.**

Seeds of the *gru-gru* nut which is widely distributed throughout Trinidad, but not in sufficient abundance for the development of an export trade. It is used locally as a roasted nut. The kernels contain 57 per cent of fat which is in a yellowish white crystalline form. (Adapted from *The Monthly Bulletin of Agricultural Intelligence and Plant Disease, vol. 5, p. 75.*)

For previous introduction, see S. P. I. No. 37382.

50466 to 50517—Continued.

50468. ASTROCARYUM JAUARI Mart. Phœnicaceæ. **Palm.**

"Seed of a palm with large nuts."

A graceful palm of medium height, with pinnate spiny leaves. Native to tropical America.

50469. CARYOCAR VILLOSUM (Aubl.) Pers. Caryocaraceæ.

"Seeds of the piquiá tree, which furnishes a hard wood especially valuable for cart work. The pulp of the fruit is edible when the whole fruit has been cooked in salted water."

For previous introduction, see S. P. I. 31204.

50470. CASSIA sp. Cæsalpiniaceæ.

"Plants."

50471. CHRYSOPHYLLUM CAINITO L. Sapotaceæ. **Caimito.**

"Plants of the caimito."

A tree 8 to 10 meters high, native to tropical America, highly esteemed there for its rose-fleshed fruit. The large, entire, elliptic leaves are glabrous above and golden tomentose beneath. The small white flowers are followed by round pale reddish yellow fruits the size of a large apple. It is a rival of the sapodilla (*Achras sapota*), which is often considered the best of tropical fruits. (Adapted from *L'Illustration Horticole, vol. 32, p. 127.*)

For previous introduction, see S. P. I. No. 46150.

50472. CHRYSOPHYLLUM sp. Sapotaceæ.

"Small seedlings from the Purus River."

50473. CHRYSOPHYLLUM sp. Sapotaceæ.

"Seed from the Purus River."

50474. CISSUS sp. Vitaceæ.

"Roots of a Cissus which I brought from the Purus River some years ago. The vine grows wild there in the forests. Except for the somewhat more rigid flesh, the fruits have more or less the taste of an Isabella wine grape."

50475. COUROUPITA GUIANENSIS Aubl. Myrtaceæ.

Plants of the cannon-ball tree, a native of British Guiana, and known there to the half-breed Spaniards as *Tapara da Sucr;* the Caribs call it *Cokoi monoh* (probably a corruption of the Spanish *Coco de monos*, that is, "monkey coconut"). The tree is plentiful in the upper Cuyuni River region and grows to a very considerable size. The trunks are straight and clear of leaf branches nearly to the top, but from about 10 feet from the ground upward they bear many of the peculiar flower and fruit branches which are very persistent. A very characteristic feature of the cannon-ball tree is the uniform change of foliage three times a year. There is no variation of this change due to age, situation, or weather. The gradual shedding of the foliage takes three or four weeks, and at last every leaf has dropped and the trees stand bare; in a few hours, rarely more than a day, the new foliage bursts forth, and in a day or two, as if by magic, the trees are vested again in full dress. The flowering branches are 2 to 5 feet long, pendent and interlaced, persistent like the foliage branches. (Adapted from *The Journal of the Board of Agriculture of British Guiana, vol. 12, p. 40.*)

50476. DRACONTIUM sp. Araceæ.

"Plants of an interesting aroid which grows wild in the open savannas at Marajo Island. No use is made of it, but I once tasted the roots cooked and roasted like potatoes and found them not disagreeable. Perhaps it may be of use in the future."

50466 to 50517—Continued.

50477. ECHINOCHLOA sp. Poaceæ. **Grass.**

"Plants."

50478. ECHINOCHLOA sp. Poaceæ. **Grass.**

"Plants of No. 287."

50479. ECHINOCHLOA sp. Poaceæ. **Grass.**

"Plants."

50480. ELAEIS MELANOCOCCA Gaertn. Phœnicaceæ. **Palm.**

"Plants, originally from the Purus River."

A large, spreading, low palm which grows in low, moist land. It is closely related to the African oil palm (*Elaeis guineensis*), and a clear oil is extracted from the kernels in small quantities by the natives, who prize it highly for cooking.

For previous introduction, see S. P. I. No. 46048.

50481. EUTERPE OLERACEA Mart. Phœnicaceæ. **Palm.**

"Seeds of the *assahy* palm originally from the Purus River and other parts of the upper Amazon."

"A graceful palm with a trunk seldom more than 4 inches in diameter. It is said that fats suitable for oils and soaps can be derived from the blue-black berrylike fruits, and a wine is made from them also." (*Lange, Lower Amazon, pp. 16, 461.*)

For previous introduction, see S. P. I. No. 46743.

50482 to 50484. GUILIELMA SPECIOSA Mart. Phœnicaceæ. **Pupunha.**
(*Bactris gasipaes* H. B. K.)

50482. Seeds of the "peach-palm" of the Amazon River, which ascends to the warm temperate regions of the Andes. The clustered stems attain a height of 40 feet. The fruit grows in large bunches, has a thick, firm, and mealy pericarp, and when cooked has a flavor between that of the potato and the chestnut, but superior to either. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 69.*)

For previous introduction, see S. P. I. No. 47868.

50483. "Plants of No. 13, a spineless variety."

50484. "Plants of No. 14, a spiny variety."

50485. IRIARTEA sp. Phœnicaceæ. **Palm.**

Plants of a tall spineless ornamental palm with few unequally pinnate leaves and cuneate leaflets. Native to Brazil.

50486. LECYTHIS sp. Lecythidaceæ.

"Seed of a tall species furnishing hard timber much used for railroad sleepers, posts, etc."

Received as *Chytroma jarana*, a name used without a description. All species of this genus are now referred to Lecythis.

50487. LUCUMA MACROCARPA Huber. Sapotaceæ.

"Seed of the *cu'itiribá grande*, an edible fruit."

A medium-sized tree with cinnamon-gray bark and glabrous lanceolate leaves crowded at the tips of the branches. The globose fruit, 10 centimeters in diameter, contains 6 to 10 shining brown seeds. Cultivated in Brazil for its fruit. (Adapted from *Huber, Boletim do Museu Paraense, vol. 3, p. 57.*)

50466 to 50517—Continued.

50488. LUCUMA RIVICOA Gaertn. f. Sapotaceæ.

"Seed of an edible fruit very much in use here. Known as *cutitiribá*."

A small handsome tree with bright-green leaves, indigenous to tropical America. The fruit is very variable, from small and carissalike to the size and shape of a large hen's egg, with yellow, sweet, rich, rather dry pulp inclosing one or two large seeds. The mealy pulp tastes somewhat like an inspiced pumpkin custard flavored with nanca. It is eaten out of hand. (Adapted from *The Philippine Farmer, vol. 5, p. 23,* and *The Philippine Agricultural Review, vol. 9, p. 249.*)

50489. MAMMEA AMERICANA L. Clusiaceæ. **Mamey.**

"Seed of the *abrico*."

A tree native to tropical America, cultivated in Jamaica up to 3,000 feet. The large fruit is edible. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 296.*)

For previous introduction, see S. P. I. No. 47425.

50490. MAXIMILIANA sp. Phœnicaceæ. **Palm.**

"Seed."

50491. ORYZA LATIFOLIA Desv. Poaceæ. **Wild rice.**

"A kind of native rice growing on not-inundated soil in Marajo. It is an interesting kind for several reasons. In the first place, it is the tallest I ever heard of, growing sometimes to a height of 8 feet. In the second place, it is a perennial kind, growing in large isolated bunches for several years, flowering and bearing seeds the whole year round. Its leaves are very broad. The kernels may not have any industrial or culinary value, but as a cattle feed the green plant might be useful. Besides this I consider this kind interesting from a phytogeographical standpoint, demonstrating that real native kinds of rice are to be found in the Amazonian region." (*Goeldi.*)

For previous introduction, see S. P. I. No. 47029.

50492. ORYZA SATIVA L. Poaceæ. **Rice.**

"Plants of No. 262."

50493. ORYZA sp. Poaceæ. **Wild rice.**

"Wild water rice plants."

50494. ORYZA sp. Poaceæ. **Wild rice.**

"(No. 296.) Wild rice plants from Belem."

50495. ORYZA sp. Poaceæ. **Wild rice.**

"(No. 290.) Wild rice plants from Soure."

50496. PHYSALIS ANGULATA L. Solanaceæ.

"Seed of *camapu*."

A much-branched herb with very small flowers and a fruiting calyx which is conical-ovoid with a sunken base, 10-angled loosely inflated, at length well filled by the greenish yellow berry. Found in open rich ground from Pennsylvania to Minnesota and southward. (Adapted from *Gray's New Manual of Botany, seventh edition, p. 715.*)

50497. ROLLINIA MUCOSA (Jacq.) Baill. Annonaceæ.

"Plants of *Cachiman morveux*."

The flowers of this species have oblong corolla lobes spreading outward in such a way as not inaptly to represent a tricorn hat. The areoles of the fruit

50466 to 50517—Continued.

are gibbous or convex. The viscous pulp is edible but of poor flavor. It grows spontaneously in the forests of Martinique and is very rarely cultivated; known locally as *cachiman morveux*. (Adapted from *Journal of the Washington Academy of Sciences, vol. 6, p. 374.*)

Received as *Annona obtusiflora*, which is referred to this species by Doctor Safford.

For previous introduction, see S. P. I. No. 44659.

50498. STENOCALYX sp. Malpighiaceæ.

"Plants."

50499. STERCULIA SPECIOSA Schum. Sterculiaceæ.

"A tall ornamental tree with seeds which are supposed to be edible after having been roasted."

50500. SYAGRUS DRUDEI Beccari. Phœnicaceæ. **Palm.**

A palm with a stem 2 to 5 meters high and smooth rigid linear glaucous leaflets on a rachis 1½ meters long. The 15 to 20 branches of the spadix are gracefully erect and bear dry yellowish drupes. Native to the central mountainous region of Brazil. (Adapted from *Martius, Flora Brasiliensis, vol. 3, p. 412.*)

50501 to 50505. THEOBROMA CACAO L. Sterculiaceæ. **Cacao.**

50501. "Seeds from the Purus River. Now in cultivation here in botanical gardens."

50502. "Seeds."

50503. "Plants bearing red pods."

50504. "Plants."

50505. "Seeds of the red-shelled cacao which we obtained a few years ago from Trinidad, British West Indies, for the botanical gardens."

50506 to 50508. THEOBROMA GRANDIFLORA (Willd.) Schum. Sterculiaceæ.

50506. "*Cupú-assú* fruits, the fine pulp of which is used to make refreshing drinks and jellies."

50507. "Plants." **50508.** "Plants."

50509. THEOBROMA MICROCARPA Mart. Sterculiaceæ.

"Plants. Originally from the Purus River."

The seeds of this tree are used as a substitute for cacao and are even considered by some to be superior to the true cacao. It is not grown commercially as yet, however. (Adapted from *Correa, Flora do Brazil, p. 101.*)

50510 and 50511. THEOBROMA SPECIOSA Willd. Sterculiaceæ.

50510. "Plants of *cacau-y*. The small cacao, the fruits of which have a delicious pulp which one eats by sucking the seeds. It grows wild in the forests here."

50511. "Plants."

50512. THEOBROMA sp. Sterculiaceæ.

"Pods of the common variety."

50513. THEOBROMA sp. Sterculiaceæ.

"Plants of the common variety."

50514. THEOBROMA sp. Sterculiaceæ.

"Plants."

Received as *Theobroma ovata*, for which a place of publication has not yet been found.

50466 to 50517—Continued.

50515. THEOBROMA sp. Sterculiaceæ.

"Plants of the common variety."

50516. (Undetermined.)

"Fruits."

Received as *Platonia insignis*, but it does not agree with material received earlier under that name.

50517. (Undetermined.)

"*Mamaca* plants."

50518. MILLETTIA MEGASPERMA (F. Muell.) Benth. Fabaceæ.

From New South Wales, Australia. Seeds presented by Hugh Dixson, Abergeldie. Received June 3, 1920.

"This plant is quite unlike Chinese or Japanese varieties of wistaria. It has dark-green foliage and is a rank grower when established; mine is growing over a park railing 90 feet long, 4 feet wide, and 5 feet high, and has to be kept within bounds on width and height. It is not particular as to soil, but I would not advise a heavy clay. The plant stands 8 to 10 degrees of frost without injury. The flowers are darker purple than those of the Chinese variety, sweet scented, and in dense panicles. It is a very shy seeder with seldom more than one seed in a pod, but it strikes root freely when layered and also from cuttings. The root of a layer afterwards potted had the largest number of nodules I have ever seen on any leguminous plant. It is an exceedingly rare plant simply because it is not known." (*Dixson.*)

50519. RHUS POTANINI Maxim. Anacardiaceæ.

From Jamaica Plain, Mass. Seeds presented by Prof. C. S. Sargent, Arnold Arboretum. Received June 4, 1920.

"Collected in northern Honan by Joseph Hers." (*Sargent.*)

An elegant Chinese shrub remarkable for the bright coloring of the leaves in autumn. The long graceful leaves are made up of deeply serrate leaflets. (Adapted from *The Gardeners' Magazine, vol. 52, p. 721.*)

On this sumach a gall insect makes its home, producing large inflated galls which the Chinese utilize for dyeing black. The foreigners found that the galls contain a great percentage of tannin and use them for dyeing purposes, exporting vast quantities from Hankow especially, under the name of Chinese gallnuts.

For previous introduction, see S. P. I. No. 40717.

50520. CHAMAEDOREA GEONOMAEFORMIS Wendl. Phœnicaceæ. **Palm.**

From Nice, France. Seeds presented by A. Robertson Proschowsky. Received June 4, 1920.

"A very graceful dicœcious palm which, on account of its small size and easy culture as a pot plant, should have some importance for decoration." (*Proschowsky.*)

50521. PLACUS BALSAMIFER (L.) Baill. Asteraceæ.
(*Blumea balsamifera* DC.)

From Manila, Philippine Islands. Seeds presented by Elmer D. Merrill, director, Bureau of Science. Received June 6, 1920.

A perennial shrubby plant, native to Borneo. The leaves when bruised smell strongly of camphor and are used medicinally by the natives. The gum from this tree is known as "Nagai camphor." (Adapted from *Macmillan, A Handbook of Tropical Gardening and Planting, second edition, p. 509.*)

50522 to 50524. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

From Mukden, China. Seeds presented by Albert W. Pontius, American consul general. Received June 7, 1920.

Market beans requested for the Office of Forage-Crop Investigations.

50522. "*Hei tou* (black)."

"A small flat shining black bean used when boiled, salted, and fermented as the main ingredient in a sauce; also fed, when boiled, to water buffaloes." (*Frank N. Meyer.*)

For previous introduction, see S. P. I. No. 45294.

50523. "*Hsiao chin huang tou* (small golden yellow bean)."

50524. "*Pai mei tou* (white-crested bean)."

A late-maturing bean, yellow with a "white eyebrow."

For previous introduction, see S. P. I. No. 30745.

50525. SYZYGIUM CUMINI (L.) Skeels. Myrtaceæ. **Jambolan.**
(*Eugenia jambolana* Lam.)

From Manila, Philippine Islands. Seeds presented by Elmer D. Merrill, director, Bureau of Science. Received June 8, 1920.

Duhat. A widely distributed Philippine timber tree frequently cultivated for its fruit which in size, color, and flavor resembles a black cherry. The grayish or pale-brown wood is moderately hard to hard and durable; even the sapwood is rarely attacked by beetles. It is used for the building of ships, wharves, and bridges, for furniture and cabinetwork, and for the heavy parts of musical instruments. (Adapted from *Schneider, Commercial Woods of the Philippines: Their Preparation and Uses, Manila Bureau of Forestry Bulletin No. 14, p. 189.*)

For previous introduction, see S. P. I. No. 43217.

50526. ACER sp. Aceraceæ. **Maple.**

From Jamaica Plain, Mass. Seeds presented by Prof. C. S. Sargent, Arnold Arboretum. Received June 11, 1920.

"A green-barked variety collected in northern Honan, China, by Joseph Hers." (*Sargent.*)

50527. ATTALEA COHUNE Mart. Phœnicaceæ. **Cohune.**

From Ceiba, Honduras. Seeds presented by Charles N. Willard, American consul. Received June 11, 1920.

"With the demand for combating the use of poison gas in the war, it was found that the shell of the cohune nut when carbonized acted as a preventive against the injurious effects of the gas. It therefore became the principal element used in the manufacture of the gas mask. The utilization of the cohune nut for war purposes served to bring to light an industry which may be permanent, namely, the extraction of oil from the kernel of the nut. The cohune (or corozo) nut is a product of the manaca palm, is indigenous to tropical countries, and is found mostly on low, damp lands, along creeks and rivers. It thrives best in the deep forests, and the greatest supply is found in virgin forest lands, of which there are extensive areas in Honduras.

"The nuts grow in large oblong clusters weighing probably 75 pounds each. A single tree will have from one to four clusters on it at a time, with an average production of four clusters a year to the tree. The nut varies in size from 1½ to 3 inches in length and from 1 to 2 inches in diameter. The shell is hard and dense, with an average thickness of one-fourth to half an inch. For cracking the nuts preparatory

to extracting the oil, two varieties of machines are used. One is designated a 'knuckle' machine, in which the nuts drop from a hopper between heavy knuckles, thus cracking the shell. The other is called an 'impact' machine. It operates by a centrifugal motion which propels the nut against the side of a large metal bowl with sufficient force to break the shell. The oil can then be extracted from this copra, or crushed product.

"The oil is high grade, said to be superior to coconut oil, and finds a ready sale for cooking purposes, being claimed to be adapted for any use to which a good cooking oil may be put.

"The Aguan River valley contains a single field of these nut-bearing trees extending 60 to 70 miles up the river from its mouth and with an average width of 10 to 12 miles." *(Willard.)*

50528. ANANAS SATIVUS Schult. f. Bromeliaceæ. **Pineapple.**

From San Jacinto, D. F., Mexico. Shoots presented by Sr. José Duvallon, Director de Agricultura. Received June 19, 1920.

"A spineless pineapple, called *Cayena*, from Coatepec zone." *(Duvallon.)*

50529. CYCLAMEN ROHLFSIANUM Aschers. Primulaceæ. **Cyclamen.**

From Libia, Tripoli. Tubers presented by Dr. E. O. Fenzi. Received June 19, 1920.

"I hope that some of your cyclamen specialists may succeed in evolving a new type combining the characters of Cyclamen and of Dodecatheon." *(Fenzi.)*

A plant native to the grottos of Gureina, Libia, where the yellow ellipsoid tubers grow in the fissures. The stem, 5 centimeters long, bears circular leaves, variegated with silvery splotches and variously incised, on petioles 3 to 18 centimeters long. The fragrant pale-purple flowers appear in autumn; the exserted anthers bring it near the neighboring genus, Dodecatheon. (Adapted from *Bulletin de l'Herbier Boissier, vol. 5, p. 528.*)

50530. ZELKOVA SINICA C. Schneid. Ulmaceæ.

From Jamaica Plain, Mass. Seeds presented by Prof. C. S. Sargent, director, Arnold Arboretum. Received June 19, 1920.

A rare Chinese tree about 17 meters (60 feet) high, with smooth pale-gray bark which exfoliates in small thin roundish flakes, leaving many brown scars. The small leaves are crenately serrate. (Adapted from *Sargent, Plantae Wilsonianae, vol. 3, p. 286.*)

50531 to 50539.

From Keijo, Chosen (Korea). Seed presented by Miss Katherine Wambold. Received June 21, 1920.

50531. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

"*Soo soo;* may be used for bread or porridge."

For previous introduction, see S. P. I. No. 42060.

50532. PERILLA FRUTESCENS (L.) Britton. Menthaceæ. **Perilla.**

"*Tŭl kai,* or *tŭl găi,* utilized for oiling the excellent oil paper used on mud floors in Chosen."

For previous introduction, see S. P. I. No. 42062.

50533. PHASEOLUS ANGULARIS (Willd.) W. F. Wight. Fabaceæ. **Adsuki bean.**

"*Pat,* peas."

For previous introduction, see S. P. I. No. 42063.

50531 to 50539—Continued.

50534. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean.**

"*Nŏk too;* used for 'mook,' a jelly."

For previous introduction, see S. P. I. No. 42064.

50535 and 50536. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

50535. "*Kong* bean."

For previous introduction, see S. P. I. No. 42059.

50536. "*Kong* bean; this is used for making sauce."

50537. VIGNA CYLINDRICA (Stickm.) Skeels. Fabaceæ. **Catjang.**

"*Tong poo;* may be used as 'mook,' a sort of jelly."

50538. VIGNA SESQUIPEDALIS (L.) Fruwirth. Fabaceæ. **Yard-Long bean.**

"*Pat ke cho kwang,* for flour or bread."

50539. ZIZIPHUS JUJUBA Mill. Rhamnaceæ. **Jujube.**
(*Z. sativa* Gaertn.)

"*Tai chew,* Korean dates."

50540 to 50542.

From Paris, France. Plant material purchased from Vilmorin-Andrieux & Co. Received May 20, 1920.

50540. MOLINIA CAERULEA (L.) Moench. Poaceæ. **Grass.**

Seed of a grass which is introduced in a few localities in the Eastern States from New England to Pennsylvania. In Europe this is considered to be a good forage grass. A form with striped leaves is cultivated as an ornamental for use in borders. (Adapted from *Hitchcock, Genera of Grasses of the United States, U. S. Department of Agriculture Bulletin No. 772, p. 50.*)

In the early stages this grass makes a fairly good grade of hay.

50541. STACHYS SIEBOLDII Miquel. Menthaceæ.

Tubers of a Chinese plant valuable for food. It is completely hardy and easy of cultivation. The crisp ivory-white tubers, 2 to 3 inches long, may be eaten in the fresh state, boiled, fried like salsify, made into sauce, or made into fritters. An analysis of the tubers shows the following percentages: Starch, 17.80; protein, 4.31; fat, 0.55; cellulose, 1.34; mineral, 1.81; water, 74.19. (Adapted from *Gardeners' Chronicle, third series, vol. 3, p. 16.*)

For previous introduction, see S. P. I. No. 21702.

50542. TRISETUM FLAVESCENS (L.) Beauv. Poaceæ. **Grass.**

"A grass resembling tall meadow oat-grass, growing on open ground, in copses and meadows, which may prove valuable as a forage crop. Native to Europe and Asia." (*A. S. Hitchcock.*)

50543 to 50579. PYRUS spp. Malaceæ. **Pear.**

From Talent, Oreg. Cuttings collected in China by Prof. F. C. Reimer, superintendent, Southern Oregon Agricultural Experiment Station. Received January 9, 1920. Numbered June, 1920.

"Varieties which I regard as very promising for America and of very great value. The introduction of this material, I believe, marks an epoch in American horticulture; this material can not be duplicated without great cost and real personal risk." (*Reimer.*)

"We have this material grafted on four kinds of stocks which will give us an interesting experiment, namely, Kieffer stocks, *Pyrus serrulata* stocks grown by us here,

French stocks sent to us by Jackson & Perkins, and Japanese stocks sent to us by Prof. Reimer. The grafts will be put out in the department grounds and watched this summer for the presence of insects and disease." (*B. T. Galloway.*)

50543. "No. 1."
50544. "No. 2."
50545. "No. 3."
50546. "No. 4."
50547. "No. 5."
50548. "No. 6."
50549. "No. 7."
50550. "No. 8."
50551. "No. 9."
50552. "No. 10."
50553. "No. 11."
50554. "No. 12."
50555. "No. 13."
50556. "No. 14."
50557. "No. 15."
50558. "No. 16."
50559. "No. 17."
50560. "No. 18."
50561. "No. 19."
50562. "No. 20."
50563. "No. 21."
50564. "No. 22."
50565. "No. 23."
50566. "No. 24."
50567. "No. 25."
50568. "No. 26."
50569. "No. 27."
50570. "No. 28."
50571. "No. 29."
50572. "No. 30."
50573. "No. 31."
50574. "No. 32."
50575. "No. 33."
50576. "No. 34."
50577. "No. 35."
50578. "No. 36."
50579. "No. 37."

50580. ARALIA CACHEMIRICA Decaisne. Araliaceæ.

From Rochester, N. Y. Plant presented by John Dunbar, assistant superintendent of Parks. Received March 30, 1920. Numbered June, 1920.

A vigorous, erect, roughly pubescent shrub, 5 to 10 feet high, native to the temperate Himalayas. The large leaves have pale lower surfaces and the white flowers are borne in panicled umbels. It is a useful fodder for goats. (Adapted from *Collett, Flora Simlensis, p. 216*, and *Watt, Dictionary of the Economic Products of India, vol. 1, p. 287.*)

For previous introduction, see S. P. I. No. 42607.

50581. GOSSYPIUM sp. Malvaceæ. **Cotton.**

From the City of Mexico, D. F., Mexico. Seed presented by Francisco V. Vidal. Received April 26, 1920.

"A drought-resistant cotton tree which has grown by accident in a crack in the cement between a masonry vault and a wall. The conditions under which the plant has developed both regarding food and moisture have been remarkable. The plant has produced about 230 bolls. There are others like it growing wild in the vicinity which present the same characteristic of resistance to drought, but not in such a degree as this one. Although the boll is small, I have decided to plant the seeds again in a regular field and cultivate them." (*Vidal.*)

50582. ALLIUM SATIVUM L. Liliaceæ. **Garlic.**

From Tamingfu, Chihli, North China. Sets presented by Rev. Horace W. Houlding, South Chihli Mission. Received June 19, 1920.

"Compound bulbs of the white garlic common here. Immense quantities are used all through this region." (*Houlding.*)

50583. Colocasia esculenta (L.) Schott. Araceæ. **Dasheen.**

From Canton, Kwangtung, China. Tubers presented by G. Weidman Groff, Canton Christian College. Received June 28, 1920.

"*Hung nga u.* A popular variety widely planted in Kwantung. Not so long in form as the *Pen long u*, which it resembles except for the red coloring of the sprout which gives it its name of 'redbud.' The flesh is white but spotted with yellow; very mealy and good. A medium early variety and heavy yielder. Planted in February or March and harvested about September. It is planted widely and brings a high price on the markets." (*Groff.*)

50584 to 50586.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 18, 1920. Quoted notes by Mr. Popenoe.

50584. Persea americana Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

"(No. 386. May 30, 1920.) Budwood of avocado No. 44, from the grounds of Chaille and Assmann, in San Vicente, a suburb of San Jose. This variety is recommended by Don Otón Jimenez as the best with which he is familiar. It is of the West Indian race and is said to have been grown from a seed brought from Santa Clara, on the Atlantic side of Costa Rica. The tree is probably 30 or 40 years old at least and is 40 feet high, broad, and round topped, with a well-formed crown and a shapely trunk branching 8 to 10 feet above the ground. The fruit, which is said to ripen in September and October, is green, obovoid in form, and probably a pound in weight at maturity. I have not seen the mature fruit, hence can not describe its quality nor the size of the seed.

"It is thought that some of the West Indian varieties of Costa Rica, which have been grown in the highlands at altitudes of 4,000 to 6,000 feet, may ripen their fruits at a time of the year which will make them valuable in California or Florida, more probably the latter. The variety under consideration comes from an altitude of approximately 4,000 feet. It can not be expected that it will prove to be much hardier than the West Indian sorts now grown in Florida."

50585. Persea americana Mill. Lauraceæ.
(*P. gratissima* Gaertn. f.)

"(No. 387. May 30, 1920.) Budwood of the *aguacate de anis*, *aguacate de mono*, or *aguacate de manzana* (anise-flavored avocado, monkey's avocado, or apple avocado). A wild avocado which I have seen only in the vicinity of La Palma and San Isidro, about 15 miles from San Jose, but which is reported also from Turrialba. The character of the tree and fruit are such as to suggest that this species, which is certainly indigenous in the mountains of central Costa Rica, is the wild prototype of the cultivated Guatemalan race, if not of the West Indian as well (since it is believed that both races are derived from a single species). The fruiting habit of the tree suggests the Guatemalan race more than the West Indian, as also the hard, granular shell and the general character of the fruit. The only point in which the plant differs noticeably from the cultivated Guatemalan avocado is in the aniselike odor and flavor of the bark, leaves, and fruit. The wild tree, which has been studied by Don Otón Jimenez and myself, has been observed up to the present only at elevations between 4,500 and 5,000 feet. It is not found in the forest, but, like several other species of Persea and allied genera which occur in Costa Rica, it frequents open places close to small streams and brooks or is found associated with a few other trees along the margins of such watercourses. The region in which it grows is one of abundant rainfall with cool but never cold weather, and the soil is a substantial clay loam. The trees we have seen have not been in any case more than 40 feet high, and all were of erect,

50584 to 50586—Continued.

almost slender habit. In general appearance they can scarcely be distinguished from Guatemalan avocados; the foliage is of a somewhat lighter shade of green than is common in the latter. The leaves are thick and stiff (for an avocado), glabrous on the upper surface, and sparsely puberulent below. The fruits, so far as observed, are borne singly on stout fruitstalks about 4 inches long. The form is roundish oblate, the greatest diameter being 2 to 3 inches. The stem is inserted without depression, nearly centrally, and the apex is only slightly flattened. There is sometimes a faint crease down one side of the fruit, from the stem nearly to the apex. The surface is moss green in color and distinctly pebbled. The dots are few to numerous, small and yellowish. The skin is 1 to 3 millimeters thick, very coarsely granular in texture, and so hard as to be woody. The flesh is dull whitish or pale brown near the seed, frequently yellowish in the fully ripe fruit, and close to the shell tinged with green. There are no fibers through the flesh, but there are numerous small, hard bodies which suggest the stone cells of certain pears. These give the flesh a gritty feeling in the mouth, described as 'sandy' by the natives. The flavor is strong, suggesting anise, but with a less noticeable nutty flavor, such as is possessed by cultivated avocados. The aniselike element is so predominant and so strong that the fruit is scarcely edible. I am told, however, that it varies in quantity and that the fruits of some trees are much better than those of others. The seed is very large, oblate, with both seed coats adhering closely to the cotyledons. It resembles in every way the seeds of many Guatemalan avocados. The flowering season is March and April, and the fruits ripen a year from the following May or June; that is, in 12 to 15 months. The fruits from some of the wild trees are harvested by the natives and carried into the villages, where they are sold. In general, however, the *aguacate de anis* is little esteemed, most of the natives going so far as to say it is not good to eat. In regard to the common name, *aguacate de anis* is the one generally used in the vicinity of La Palma, and *aguacate de mono* is occasionally heard. In Turrialba I am told that the name *aguacate de manzana* is current.

"This species will be studied further to determine its relationship with the cultivated avocados. It is introduced with this object in view and in the hope that it may prove to be a vigorous stock plant on which to graft some of the cultivated avocados."

50586. DUGGENA PANAMENSIS (Cav.) Standl. Rubiaceæ.

"(No. 385. May 30, 1920. Herb. No. 991.) Cuttings of an attractive shrub found wild and cultivated in the region of La Palma, at elevations of about 5,000 feet. The region is one of cool, moist climate and heavy soil. The plant, which has narrow, long-pointed leaves, is of erect habit and reaches about 10 feet in height. Its flowers, which are freely produced on graceful pendent panicles about 4 inches long, are small, star shaped, and of delicate pink color. Said to grow readily from cuttings. The species merits a trial in southern Florida and California."

50587. ORYZA SATIVA L. Poaceæ. **Rice.**

From Vercelli, Italy. Seed presented by Dr. Novello Novelli, director, Stazione Sperimentale di Risicoltura. Received June 12, 1920.

"*Yellow Early Ardizzone.*" (*Novelli.*).

A rice of low erect growth with delicate yellowish green culms. The endosperm is brittle, permitting the securing of a commercial rice of pearly transparent brightness, with a faint yellow tinge. The ability to stool is on the average with, in some cases superior to, that of the common early rices, and from the reports of the weight of the unpolished grain one may conclude that this variety is very productive. The residue from milling is good, and there is but a small percentage of waste. (Adapted from *Il Giornale di Risicoltura, vol. 9, p. 20.*)

50588. ULMUS PUMILA L. Ulmaceæ. **Elm.**

From Peking, Chihli, China. Seed presented by the Forestry Department of the Ministry of Agriculture and Commerce, through Forsythe Sherfesee. Received June 22, 1920.

The Chinese drought-resistant elm which has proved to be a very valuable tree for practically the entire United States.

For previous introduction, see S. P. I. No. 45025.

50589. ULMUS PUMILA L. Ulmaceæ. **Elm.**

From Nanking, Kiangsu, China. Seeds presented by J. Hers, secretary of the Lung Hai Railway, from near Chengchow, Honan, through John H. Reisner, Nanking University. Received June 24, 1920.

"The Chinese elm has proved to be adapted to a very wide area of country. It has proved to be one of the best trees for shelter-belt work in the arid Northwest and thrives in the central part of the Great Plains region and throughout California." (*David Fairchild.*)

For previous introduction, see S. P. I. No. 45025.

50590. ANDROPOGON sp. Poaceæ. **Grass.**

From Kisantu, Belgian Kongo. Seeds presented by Father H. Vanderyst. Received July 29, 1920.

Numbered for convenience in testing by the Office of Forage-Crop Investigations.

50591 and 50592.

From New Orleans, La. Plant material presented by Charles Dittmann. Received May 29, 1920. Quoted notes by Mr. Dittmann.

50591. ASTROCARYUM sp. Phœnicaceæ.

"*Indaiassu* nuts from Brazil."

This might be the one from which the fiber *tucum* is obtained.

50592. COUEPIA sp. Rosaceæ.

"*Oticia* nuts from Brazil."

50593. ANDROPOGON sp. Poaceæ. **Grass.**

From Kisantu, Belgian Kongo. Seeds presented by Father H. Vanderyst. Received July 29, 1920.

Numbered for convenience in testing by the Office of Forage-Crop Investigations.

50594 and 50595. ORBIGNYA SPECIOSA (Mart.) Barb.-Rodr. Phœnicaceæ. **Babassu.**

From New Orleans, La. Plant material presented by Charles Dittmann. Received May 29, 1920. Quoted notes by Mr. Dittmann, except as otherwise stated.

50594. "*Babassu* nuts from Brazil. (No. 1.)"

"In the Provinces of El Oro and Azuay, Ecuador, is a large American-owned tract of land called 'Rosa de Oro y Piedad,' which is located partly among the foothills of the western Andes and partly on the coastal plain, about 5,000 acres being practically level. With the exception of a limited area that has been cleared for pastures and cacao growing, the property is covered with the usual tropical growth, including timber of variable value.

"Nut-bearing palm trees (*Orbignya speciosa*) occupy a fan-shaped area 1½ miles wide and many miles long, one plat of a thousand acres carrying 10 or more trees to the acre. Each tree bears one to three bunches of nuts, a bunch containing 5,000 to 9,000 nuts, and has a stalk several feet in length with 500 to 700

50594 and 50595—Continued.

branch stalks, each of which bears 5 to 20 nuts. When the nuts are ripe the stalk falls to the ground, the harvest continuing throughout the year. The estimated average yield of nuts per tree each year is 1,000 pounds, one-half the weight being lost in drying. The kernel represents one-third the weight of the dried nut and contains 60 per cent of palm oil, each tree averaging 100 pounds of oil.

"Machinery has been installed for crushing the nuts and extracting the oil, which finds a market in the United States." (*Frederick W. Goding.*)

For previous introduction, see S. P. I. No. 41254.

50595. "*Babassu* nuts from Brazil. (No. 2.)"

See preceding number for description.

50596. ANDROPOGON sp. Poaceæ. **Grass.**

From Kisantu, Belgian Kongo. Seeds presented by Father H. Vanderyst. Received July 29, 1920.

Numbered for convenience in testing by the Office of Forage-Crop Investigations.

50597 to 50607.

From Guayaquil, Ecuador. Seeds presented by James Birch Rorer, Asociación de Agricultores del Ecuador. Received June 14, 1920. Quoted notes by Mr. Rorer except where otherwise noted.

50597. ANNONA SQUAMOSA L. Annonaceæ. **Sugar-apple.**

"Seeds from two very good fruits, from Chobo, Las Guayas, Ecuador."

For previous introduction, see S. P. I. No. 47875.

50598. CAESALPINIA PULCHERRIMA (L.) Swartz. Cæsalpiniaceæ.

"*Pride of Barbados*, from Chobo, Las Guayas, Ecuador."

This Caesalpinia is widely distributed throughout the Tropics because of the beauty of its blossoms. Where favorably situated, with plenty of light and sunshine and ample space for development, it attains the dimensions of a large shrub or small tree. Its dark-green pinnate leaves are decidedly ornamental, and the flowers, 2 inches in diameter, in magnificent open clusters at the points of the shoots, are scarlet, edged with gold, a striking combination, the effect of which is heightened by the crisping or frilling of the margins of the petals. The long red stamens also form another notable feature. (Adapted from the *Journal of Horticulture and Home Farmer, third series, vol. 66, p. 204.*)

50599. CANNA sp. Cannaceæ. **Canna.**

"*Plantanillo*, a wild canna with yellow flowers, from Chobo, Las Guayas, Ecuador."

50600. CANNA sp. Cannaceæ. **Canna.**

"*Plantanillo*, a wild canna with red flowers, from Chobo."

50601. CASSIA OCCIDENTALIS L. Cæsalpiniaceæ.

"Small legume possibly good for cover crop, from Pascuales, Las Guayas, Ecuador."

A low shrub with a leaf like the mimosa. The Stinkard's root, as it is sometimes called, is a powerful drastic; homeopaths infuse it in spirits of wine and employ it as quinine; the beans are sometimes made into coffee, as maize is in the United States. (Adapted from *Burton, The Highlands of Brazil, vol. 2, p. 60.*)

For previous introduction, see S. P. I. No. 42830.

50597 to 50607—Continued.

50602. MAXIMILIANEA VITIFOLIA (Willd.) Krug and Urb. Cochlospermaceæ. (*Cochlospermum hibiscoides* Kunth.)

"*Silk cotton*, seed and lint from Summit, Canal Zone."

"A common shrub or small tree of eastern and central Guatemala from the highlands at about 4,000 feet down to a level of 1,000 feet or perhaps lower. The plant occasionally reaches a height of 35 feet, is always stiff, rather sparsely branched, and bears stout branchlets which usually carry leaves only toward their tips. The plant is leafless from December or January to May in most sections, and at this period it produces at the end of the branchlets numerous large yellow flowers, single, brilliant in color, with a deep-orange center. They are followed by oval seed pods as large as a hen's egg." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 44821.

50603. MIMOSA sp. Mimosaceæ.

"*Espiño*, from Chobo, Las Guayas, Ecuador, a plant which may become a pest in pastures, but is good for hedges."

50604. PRUNUS SEROTINA Ehrh. Amygdalaceæ. **Capulin.**

"*Capulin*, from Ambato, Ecuador."

"The wild cherry, found both wild and cultivated in the mountains of Guatemala, from elevations of about 4,000 feet up to 9,000 feet or perhaps higher. As commonly seen, the tree is erect, often somewhat slender, reaching a height of about 30 feet, the trunk stout and occasionally as much as 3 feet thick, and the bark rough and grayish. The young branchlets are dotted with grayish lenticels. The leaves, which are borne upon slender petioles three-fourths of an inch long, are commonly 4¼ inches in length, 1¼ to 1½ inches in breadth at the widest point, oblong-lanceolate in outline, with a long, slender tip. The upper surface is dull green, the lower surface glaucous, and the margin is rather finely serrate. The flowers, which are produced from January to May, are white, about three-eighths of an inch wide, and very numerous on slender racemes 2 to 4 inches in length. As many as 15 or 20 fruits sometimes develop on a single raceme, but many drop off before reaching maturity, with the result that two to five ripe fruits are commonly found on each raceme. The season of ripening in Guatemala is from May to September. The ripe fruits, which are slightly oblate in form and up to three-fourths of an inch in diameter, separate readily from the short fruitstalks, leaving the green 5-toothed calyxes adhering to the latter. In color the fruit is deep glossy maroon-purple. The skin is thin and tender, but so firm that the fruit is not easily injured by handling. The flesh is pale green, meaty, but full of juice. The flavor is sweet, suggestive of the Bigarreau type of cherry, with a trace of bitterness in the skin. The stone is a trifle large in comparison to the size of the fruit.

"Pleasant to eat out of hand, this cherry can also be eaten in various other ways—stewed or made into preserves or jams. In Guatemala it is most commonly eaten out of hand and as a sweet preserve.

"This species does not appear to be adapted to hot tropical seacoasts, but it seems to be distinctly subtropical in character. It may succeed in moist subtropical regions, such as Florida, where other types of cherries do not thrive." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 44885.

50605. PSIDIUM GUAJAVA L. Myrtaceæ. **Guava.**

"Seeds from the largest fruit of this kind I have ever seen; it measured a little over 3 inches in diameter."

For previous introduction, see S. P. I. No. 48575.

50597 to 50607—Continued.

50606. SIDA RHOMBIFOLIA L. Malvaceæ.

"*Escoba*, from Chobo, Las Guayas, Ecuador."

A half-shrubby weed growing by the roadsides and in open places, having yellow flowers which open at about half-past 10 o'clock in the morning and soon fade to a whitish color. It yields a good fiber, which in Australia is known as Queensland hemp. This is fine, strong, white, and lustrous and is easily extracted. It is softer and finer than jute, but shorter. Experiments made with this fiber show that a cord 12.5 millimeters in circumference will sustain a weight of 400 pounds. In Guam fresh plants are gathered each morning and made into bundles which serve as brooms. (Adapted from *Safford, Useful Plants of Guam, p. 375.*)

For previous introduction, see S. P. I. No. 46990.

50607. SOLANUM QUITOENSE Lam. Solanaceæ. **Naranjilla.**

"*Naranjilla.* From fruits bought in the market at Guayaquil, Ecuador."

For previous introduction, see S. P. I. No. 47951.

50608. SYZYGIUM CUMINI (L.) Skeels. Myrtaceæ. Jambolan.

(*Eugenia jambolana* Lam.)

From Manila, Philippine Islands. Seeds presented by Elmer D. Merrill, director, Bureau of Science. Received June 19, 1920.

A tall handsome tree native to southern Asia, ascending to an altitude of 5,000 feet in Kumaon and Polynesia and probably hardy in extratropical latitudes. The edible fruit is about the size of a cherry and is purplish black when ripe; it may perhaps be improved by culture; fruits 1½ inches long have been produced under cultivation. The seeds are used as a remedy for diabetes. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 213.*)

For previous introduction, see S. P. I. No. 43217.

50609 to 50623.

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received June 7, 1920. Quoted notes by Mr. Johnson.

50609. BEGONIA sp. Begoniaceæ. **Begonia.**

"(No. 182.) A rather abundant rhizomatous plant from Chama, with smooth leaves 6 to 12 inches in diameter. The cymes of white flowers on long stems are very ornamental."

50610. BEGONIA sp. Begoniaceæ. **Begonia.**

"(No. 173.) An upright plant from Chama, with white flowers and reddish leaves."

50611. BEGONIA sp. Begoniaceæ. **Begonia.**

"(No. 180.) An upright plant from Coban, with pink flowers. Seems to prefer clay soils."

50612. BEGONIA sp. Begoniaceæ. **Begonia.**

"(No. 181.) An upright plant from Chama, with smooth leaves and pink flowers. Very ornamental when in full flower."

50613. BEGONIA sp. Begoniaceæ. **Begonia.**

"(No. 172.) Similar to *Begonia ricinifolia*. A plant from Chama, with pink flowers and leaves marked with deep green on a lighter field. Plant smaller here."

50614. CHAMAEDOREA sp. Phœnicaceæ. **Pacaya.**

"(No. 183.) Pacaya palm."

For previous introductions, see S. P. I. No. 44059.

50609 to 50623—Continued.

50615. IPOMOEA sp. Convolvulaceæ. **Morning-glory.**

"(No. 176.) A very ornamental vine, vigorous, covered with soft prickles. The flowers, 4 to 5 inches in diameter, are pink with deeper pink veins; the throat is yellow and the corolla thick and succulent."

50616. LASIACIS DIVARICATA (L.) Hitchc. Poaceæ. **Grass.**

"(No. 177.) A grasslike plant climbing up in second growth."

For previous introduction, see S. P. I. No. 24879.

50617. NYMPHAEA BLANDA G. F. W. Meyer. Nymphæaceæ. **Water lily.**

"(No. 184.) A tender, night-blooming water lily from Lago Izabal, native to tropical America, with creamy white flowers, 4 inches across, closing very early in the morning." (*Peter Bisset.*)

50618. PASSIFLORA FOETIDA L. Passifloraceæ.

"(No. 175.) A hairy leaved plant, not a large grower, which may be of value in hybridizing or as an ornamental. The flowers are light purple to almost blue, and the calyx is laciniated. The edible fruit is bright cherry red, shining, and three-eighths to three-fourths of an inch in diameter."

For previous introduction, see S. P. I. No. 38989.

50619. RUBUS sp. Rosaceæ. **Raspberry.**

"(No. 167.) A vigorous grower with canes fully 10 feet long."

50620. SOLANUM sp. Solanaceæ.

"(No. 168.) From hillsides above Tactic. The plant climbs up through the underbrush. The leaves are similar to those of a tomato plant, and the fruits look exactly like a small pepino (*Solanum muricatum*) and are about half an inch long. I have not been able to find any use for the fruit, though it does not have a bad flavor. It may be of use to cross with the pepino to produce a more robust and fruitful plant."

50621. TECOMA sp. Bignoniaceæ.

"(No. 179.) A vine which grows to the tops of lofty trees and is very handsome when in flower. The flowers are pink and borne in terminal clusters."

50622. (Undetermined.)

"(No. 169.) A very pretty, semiscandent, lax plant, climbing up in the second growth and flowering throughout the year; the fine tubular flowers are bright red."

50623. (Undetermined.)

"(No. 185.) A small epiphytic shrub 2 to 2½ feet high with lavender, lilac-like flowers in spikes 4 to 12 inches long borne from the very base of the plant almost to the top. It is very pretty and floriferous and may be useful as a hothouse plant. It should be easy to root from cuttings, as the plant is hard-wooded. This specimen was found growing on a stump on the road to Chama."

50624. KOKIA DRYNARIOIDES (Seem.) Lewton. Malvaceæ. **Kokio.**

From Honolulu, Hawaii. Seeds presented by J. F. Rock, botanist, College of Hawaii. Received May 20, 1920.

"Seeds from a cultivated tree on Molokai." (*Rock.*)

An interesting tree with long-petioled cordate leaves and red, silky flowers. The seeds in the thick woody ovoid capsule are covered with a short reddish brown tomentum. Several trees occurred on the west end of Molokai at Mahana, but have now died, owing to the ravages of cattle, sheep, and goats which eat off the bark and leaves. (Adapted from *Rock, The Indigenous Trees of the Hawaiian Islands, p. 307.*)

For previous introduction, see S. P. I. No. 47223.

50625 to 50634.

From Cape Town, Cape Colony. Seeds presented by J. Burtt Davy through George H. Murphy, American consul general. Received June 18, 1920.

"An exceedingly valuable consignment which might be useful in Porto Rico."

50625 to 50633. COFFEA spp. Rubiaceæ. Coffee.

50625. COFFEA ARABICA COLUMNARIS Cramer.

A variety of *Coffea arabica* which is characterized by its slender columnar growth. (Adapted from *Teysmannia, vol. 18, p. 230.*)

50626. COFFEA ARABICA MARAGOGIPE Froehn.

This variety is distinguished by the larger size and thicker character of the leaves and fruit, and in these points it tends toward *Coffea liberica.* It was discovered by Crisogono José Fernandez in 1870, and because of the fine flavor of the beans has been introduced into Brazil and the English colonies. (Adapted from *Engler, Botanische Jahrbücher, vol. 25, p. 263.*)

50627. COFFEA ARNOLDIANA Wildem.

A Belgian Kongo plant with deep-green obovate or oblong leaves, shining above, becoming a deep reddish brown when dry. There are one to five flowers to an involucre in the axillary inflorescence; the calyx is glossy and the disk prominent in the fruit. (Adapted from *Wildeman, Mission Emile Laurent, p. 325.*)

50628. COFFEA ARUWIMIENSIS Wildem.

A sturdy tree with oblong or oblong-lanceolate leaves, obtuse at the apex, the tip shortly acuminate, cuneiform at the base, brown when dry, paler beneath. The flowers with short involucres are in axillary globular clusters. The persistent sepals completely inclose the fruit, which is surmounted with a short cylindrical disk. The inflorescence is covered with a thick varnish, which is shining when dried. Native to Belgian Kongo. (Adapted from *Wildeman, Mission Emile Laurent, p. 321.*)

50629. COFFEA CANEPHORA SANKURUENSIS Wildem.

A plant with elliptic-oblong leaves shortly acuminate, rounded at the base and summit, dull and paler beneath, shining above. The 5-parted flowers are in dense cymes united in a common involucre of which the stipulelike bracts are triangular and keeled. There are three to four inflorescences in each leaf axil. The fruits, with one or two seeds, are in dense, almost sessile clusters. (Adapted from *Wildeman, Mission Emile Laurent, p. 330.*)

50630. COFFEA CONGENSIS CHALOTII Pierre.

A Belgian Kongo plant with leaves 20 centimeters long and inflorescences either solitary or two or three in each leaf axil. The bracts enveloping the inflorescence are short and linear or long and broad. The flowers are five or six parted. A fruiting cyme may bear five slender-pediceled fruits in a cluster. The fruiting pedicel is always longer than the bract. (Adapted from *Wildeman, Mission Emile Laurent, p. 335.*)

50631. COFFEA DEWEVREI Wildem. and Dur.

A tree 15 meters high with shining gray bark and obovate-elliptic leaves, shining above, and yellow when dried. The 5-parted corolla has a tube 1 centimeter long and elliptic-lanceolate lobes; the red fruit is elliptical. (Adapted from *Bulletin de la Société Royale de Botanique de Belgique, vol. 38, p. 202.*)

For previous introduction, see S. P. I. No. 31758.

50625 to 50634—Continued.

50632. COFFEA EXCELSA Cheval.

A species closely allied to *Coffea liberica*, but a stronger grower and apparently a better producer; the seeds, however, are smaller than that of the true Liberian coffee. It is apparently a plant which has considerable powers of thriving under very adverse conditions. Nearly 9 pounds of berries to a tree have been gathered from this variety. It prefers low situations, but may be planted up to 2,000 feet above sea level. They are large-leaved trees of vigorous growth.

Below is a table showing the weight (in kilograms) of berries of various coffees required to give 1 kilogram of marketable coffee:

Coffea canephora var. *sankuruensis*, 4.7; *C. canephora*, 3.8; *C. robusta* (Java), 3.8; *C. excelsa*, 5.5; *C. liberica*, 12; *C. dewevrei*, 8.3; *C. aruwimiensis*, 6.7. *C. excelsa* is found in the wild state in central Africa at altitudes of 2,200 feet in a climate which is dry for six months of the year and has a rainfall of at least 40 inches during the remaining six months. The temperature in summer is tropical, while in December and January it falls below 10° C. (50° F.) at night. This type does well in equatorial regions, has a satisfactory strength in caffein, and though somewhat bitter it has an excellent flavor. In Tonking its growth has been remarkable and entirely free from insect and fungoid pests. The bean is small and uniform in size, and it is hoped to sell it in competition with Arabian coffee blended with Mocha. In appearance it is less luxuriant than *C. liberica*, though it is hardier and earlier. This species is particularly robust in Java. It commences to flower in the second year and yields a crop of berries in the third year.

The value of the coffee approaches that of the Liberian coffee and amounts to about £20 per acre. The beans require particular care, since they are inclosed within a thin skin which must be completely removed before the highest prices can be obtained. (Adapted from *Bulletin of the Department of Agriculture, Trinidad and Tobago, vol. 17, p. 62.*)

50633. COFFEA sp.

Received as *Coffea wanniraluula*, for which a place of publication has not yet been found.

50634. ELAEIS GUINEENSIS Jacq. Phœnicaceæ. **Oil palm.**

The trunk of the oil palm is from 15 to 25 meters in height and is crowned with a cluster of 25 to 30 pinnate leaves. In the center of this crown is the terminal bud, consisting of young leaves closely folded, the tissue of which is white and tender. This is the palm-cabbage which the natives use largely for food.

Incisions are made in the terminal part of the trunk, and often the tree is felled in order to prepare from the pith palm wine, a drink which is very much enjoyed by the natives. In certain regions of the Ivory Coast they cultivate this palm almost entirely for the wine and do not hesitate to sacrifice thousands of trees every year to obtain the palm must.

The tree does not begin to produce fruit until toward the fifth year. This fruit is more or less like an elongated and flattened plum. It grows in bunches, the weight of which varies, according to the variety and the country, between 5 and 12 or even 15 kilograms. The pericarp of the fruit is fleshy and fibrous and very rich in fatty matter, and from it the palm oil is extracted. When the pericarp is removed, the palm nut, which is very hard, remains, and this contains the kernel from which palm-nut oil is extracted.

50625 to 50634—Continued.

There are numerous varieties of oil palms along the West African coast extending sometimes for a distance of 100 or 125 kilometers. In 1909 the palm trees in West Africa produced more than 100,000 tons of oil and 250,000 tons of palm kernels, and yet this is only a part, perhaps a third, of the amount that Africans could supply, allowing about another third, which is required by the natives for food. (Adapted from *The Monthly Bulletin of Agricultural Intelligence and Plant Diseases, vol. 2, p. 314.*)

For previous introduction, see S. P. I. No. 18633.

50635 to 50647.

From Nanking, Kiangsu, China. Seeds presented by John H. Reisner, University of Nanking. Received April 9, 1920. Quoted notes by Mr. Reisner.

50635. ALEURITES FORDII Hemsl. Euphorbiaceæ. **Tung-oil tree.**

"From Chuchow, Anhwei, north of Yangtze."

For previous introduction and description, see S. P. I. No. 44661.

50636 and 50637. CUCUMIS SATIVUS L. Cucurbitaceæ. **Cucumber.**

50636. "*Chinese long green.*" **50637.** "*Chinese long white.*"

50638. GLEDITSIA SINENSIS Lam. Cæsalpiniaceæ.

"A handsome Chinese tree known as 'Tsao-k'o shu,' abundant throughout the Yangtze Valley up to 3,500 feet altitude. It grows 60 to 100 feet tall and has a thick trunk, smooth gray bark, a spreading head with massive branches, small pinnate leaves, and inconspicuous greenish flowers. The latter are followed by pods or 'beans,' which, when ripe, are black, 6 to 14 inches long and three-fourths of an inch to 1½ inches wide. These pods are broken up and are in general use for ordinary laundry work, producing a good lather in either hot or cold water. They are also used in the process of tanning hides. The saponaceous fat is contained in the pod itself, which is the only part utilized, the hard, flattened brown seeds being discarded." (*Wilson, A Naturalist in Western China, vol. 2, p. 71.*)

For previous introduction, see S. P. I. No. 45803.

50639 and 50640. HELIANTHUS ANNUUS L. Asteraceæ. **Sunflower.**

50639. "*Black seeded.*" **50640.** "*White seeded.*"

50641. JUGLANS REGIA L. Juglandaceæ. **Walnut.**

"From Pochow, Anhwei, China."

50642. KOELREUTERIA APICULATA Rehd. and Wils. Sapindaceæ.

A tree, 3 to 12 meters high, with a dense, spreading head and dark-gray bark-bearing bipinnate leaves, 18 to 35 centimeters long, and erect terminal many-flowered panicles of yellow flowers which are sometimes used to make a yellow dye for cotton cloth and silk fabrics. Native to China. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 191.*)

50643. RICINUS COMMUNIS L. Euphorbiaceæ. **Castor-bean.**

"Castor beans."

50644. SPINACIA OLERACEA L. Chenopodiaceæ. **Spinach.**

"Chinese early long leaf."

50645. STILLINGIA SEBIFERA (L.) Michx. Euphorbiaceæ.

"A long-lived tree, 40 to 50 feet high, which occurs in all the warmer parts of China and is remarkable for the beautiful autumnal tints of its foliage. It yields the valuable Chinese vegetable tallow of commerce. In Hupeh, where

50635 to 50647—Continued.

the industry is well looked after, the larger branches are kept 'headed in' to facilitate the gathering of the fruits. The fruits are three celled, flattened ovoid, and about 1.5 centimeters in diameter. When ripe they are blackish brown and woody in appearance and are either gathered from the trees by hand or knocked off by the aid of bamboo poles. After being collected, the fruits are spread in the sun, where they open, and each liberates three elliptical seeds, which are covered with a white substance. This covering is a fat or tallow and is removed by steaming and rubbing through a bamboo sieve having meshes sufficiently small to retain the black seeds. The fat is collected and melted; afterwards it is molded into cakes, in which state it is known as the 'pi-yu' of commerce. After the fatty covering has been removed the seeds are crushed and the powdered mass is subjected to partial roasting in shallow pans. Then it is placed in wooden vats, fitted with wicker bottoms, and thoroughly steamed over boiling water. Next, with the aid of an iron ring and straw, it is made into circular cakes about 18 inches in diameter. These cakes are arranged edgeways in a large press, and, when full, pressure is exerted by driving in one wedge after another, thereby crushing out the oil, which falls into a vat below. The oil expressed from the seeds is the 'ting-yu' of commerce. Very often no attempt is made to separate the fat and the oil. The seeds with their white covering are crushed and steamed together and submitted to pressure, the mixed product so obtained being known as 'mou-yu.' The yield of fat and oil is about 30 per cent by weight of the seeds. In China all three products are largely employed in the manufacture of candles. The pure 'pi-yu' has a higher melting point than the 'ting-yu' or the mixture 'mou-yu.' All Chinese candles have an exterior coating of insect white wax, but when made from 'pi-yu' only the thinnest possible covering of wax is necessary (one-tenth of an ounce to a pound). All three products of the vegetable-tallow tree are exported in quantity to Europe, where they are used in the manufacture of soap, being essential constituents of certain particular forms of this article." (*Wilson, A Naturalist in Western China, vol. 2, p. 68.*)

For previous introduction, see S. P. I. No. 47363.

50646. THEA SASANQUA (Thunb.) Nois. Theaceæ.
(*Camelia sasanqua* Thunb.)

A large, wide-spreading ornamental shrub or small tree common throughout the warmer parts of Japan. The branches are very slender, and in the wild plant the flowers are always white. It is a popular garden shrub, and under cultivation forms with pink and rose-colored flowers are common. The seeds contain an inferior sort of oil used by the Japanese women for dressing their hair. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 394.*)

For previous introduction, see S. P. I. No. 35248.

50647. TOONA SINENSIS (Juss.) Roemer. Meliaceæ.
(*Cedrela sinensis* Juss.)

A tree 80 feet high with a straight trunk, common in western Hupeh up to 4,500 feet. The young shoots are cooked and eaten as a vegetable. The valuable wood is beautifully marked with rich-red bands on a yellow-brown ground. Foreigners call it "*Chinese mahogany.*" It is easily worked, does not warp or crack, and is esteemed for making window sashes, door joists, and furniture. (Adapted from *Wilson, A Naturalist in Western China, vol. 2, p. 22.*)

For previous introduction, see S. P. I. No. 38805.

INDEX OF COMMON AND SCIENTIFIC NAMES.

Abelmoschus esculentus, 49977.
Abo, *Annona senegalensis*, 49843.
Acacia spp., 50111, 50113–50114, 50135.
arabica. See *A. scorpioides*.
buxifolia, 49890.
giraffae, 50102.
glandulifera, 50104, 50105, 50112.
litakunensis, 50103, 50106.
pallens, 50107.
robusta, 50108.
scorpioides, 50109, 50110.
Acanthosicyos horrida, 50115.
Acer sp., 50526.
campbellii, 50359.
laevigatum, 50360.
thomsoni, 50361.
Achras zapota, 50466.
Acrocomia sclerocarpa, 50467.
Actinidia spp., 49847, 49848.
purpurea, 50403.
Adenanthera pavonina, 49955.
Agathosma chortophila, 50116.
Agave americana, 49836.
sisalina, 49837.
Albizzia lebbeck, 49956.
Aleurites fordii, 50635.
montana, 50353.
Algaroba, *Prosopis chilensis*, 50094.
Allium cepa, 49911, 50346.
sativum, 50582.
Almond, *Amygdalus communis*, 50117.
Altingia excelsa, 50395.
Alysicarpus vaginalis, 50354.
Amaranth, *Amaranthus* sp., 50221.
Amaranthus sp., 50221.
Amorphophallus sp., 50327.
Amygdalus communis, 50117.
Anacardium occidentale, 49827, 50118.
Ananas sativus, 49835, 49861, 49895–49897, 50528.
Anchusa officinalis, 49866.
Andropogon spp., 50345, 50590, 50593, 50596.
Anemone sylvestris, 49922.
vitifolia, 49923.
Angophora cordifolia, 49841.
Annatto tree, *Bixa orellana*, 50222.
Annona muricata, 49978, 49979.
reticulata, 49980, 50211.
senegalensis, 49843.
squamosa, 50069, 50597.
Anthistiria ciliata. See *Themeda quadrivalvis*.
Apium graveolens, 49912, 50442.
Arachis hypogaea, 49844, 49876, 49981, 50382.
Aralia cachemirica, 50580.
Aroma, *Prosopis vidaliana*, 50381.
Ash, *Fraxinus floribunda*, 50366.
Asparagus spp., 49957, 49982, 50119.
laricinus, 49815.
Astilbe rivularis, 50362.
Astrebla pectinata curvifolia, 50340.
triticoides, 50341.
Astrocaryum sp., 50591.
jauari, 50468.
Atalaya hemiglauca, 49891.
Attalea cohune, 50527.
Avena sativa, 50349–50351.
Avocado, *Persea americana*, 50584.
wild, 50585.

Babassu, *Orbignya speciosa*, 50594, 50595.
Babul, *Acacia scorpioides*, 50109, 50110.
Bactris gasipaes. See *Guilielma speciosa*.
Balanites aegyptiaca, 50120, 50121.
maughamii, 50122.
Barberry. See *Berberis* spp.
Barleria lupulina, 49852.
prionitis, 49853.
Barley, *Hordeum vulgare coeleste*, 49808.
Barosma betulina, 50123.
crenulata, 50124.
Baryxylum africanum, 50125.
Bauhinia sp., 50127.
reticulata, 50126.
Bean, adsuki, *Phaseolus angularis*, 50533.
common, *Phaseolus vulgaris*, 50065, 50172, 50173, 50250–50267.

Bean, jack, *Canavali ensiforme*, 49987.
Lima, *Phaseolus lunatus*, 50217.
mung, *Phaseolus aureus*, 49857, 49917, 50171, 50248, 50249, 50348, 50384, 50531.
soy, *Soja max*, 49828–49834, 49918–49920, 50385, 50440, 50441, 50522–50524, 50535, 50536.
sword, *Canavali gladiatum*, 50383.
tepary, *Phaseolus acutifolius latifolius*, 49820, 50169, 50170.
yam, *Cacara erosa*, 49797, 50436.
Yard-Long, *Vigna sesquipedalis*, 50377, 50386, 50538.
Beet, *Beta vulgaris*, 49913, 50443.
Begonia spp., 50213, 50609–50613.
convallariodora, 50212.
Berberis sp., 50405.
aggregata prattii, 49929.
angulosa, 49924.
beaniana, 49925.
concinna, 49926.
dubia, 49927.
hookeri, 49933.
lycium, 49928.
poireti, 50404.
soulieana, 49930.
thibetica, 49931.
tischleri, 50288.
umbellata, 49932.
wallichiana. See *B. hookeri*.
Berlinia sp., 49958.
Beta vulgaris, 49913, 50443.
Betula ermani, 50289.
kenaica, 50290.
Bichea sp., 49863.
Bidens pilosa, 49959.
Bilberry, red, *Vaccinium vitis-idaea*, 50344.
Birch, *Betula* spp., 50289, 50290.
Bixa orellana, 50222.
Blackberry, *Rubus* spp., 50293, 50328–50330.
Blumea balsamifera. See *Placus balsamifer*.
Bothriocline sp., 49983.
Brachiaria brizantha, 49984.
Brachystegia spp., 49960, 50070, 50128–50131, 50207.
Bramble, *Rubus* sp., 50401.
Brassica pekinensis, 49914, 49915, 50444–50449.
rapa, 50450.
Bromus macrostachys lanuginosus, 49805.
madritensis, 49806.
Buchu, *Barosma crenulata*, 50124.
Buckwheat, *Fagopyrum vulgare*, 50438.

Cabuyao, *Citrus hystrix*, 50309.
Cacao, *Theobroma cacao*, 50501–50505.
Cacara erosa, 49797, 50436.
Caesalpinia pulcherrima, 49985, 50071, 50598.
Caillica nutans, 49816, 50132.
Caimito, *Chrysophyllum cainito*, 50471.
Cajan indicum, 49850, 49986.
Camelia sasanqua. See *Thea sasanqua*.
Canavali ensiforme, 49987.
gladiatum, 50383.
Canna spp., 50599, 50600.
indica, 50072.
Capriola incompleta, 50133.
Capsicum annuum, 49988, 50223.
Capulin, *Prunus serotina*, 50604.
Carica papaya, 50376.
Carrot, *Daucus carota*, 49946.
Caryocar villosum, 50469.
Cashew, *Anacardium occidentale*, 49827, 50118.
Casimiroa edulis, 50379.
Cassava, *Manihot esculenta*, 49838, 50080, 50388.
Cassia spp., 49991, 50134, 50470.
alata, 49989.
didymobotrya, 49961.
occidentalis, 49990, 50601.
Castor-bean, *Ricinus communis*, 50030, 50031, 50083, 50084, 50271–50277, 50643.
Casuarina torulosa; 49854.
Catjang, *Vigna cylindrica*, 50537.
Cedrela sinensis. See *Toona sinensis*.
Cedrus atlantica, 50313.
Ceiba pentandra, 50136, 50224.
Celastrus spp., 50407.
loeseneri, 50406.
Celery, *Apium graveolens*, 49912, 50442.
Celtis koraiensis, 50408.
Cerinthe minor, 49867.
Chaetochloa sp., 49992.
Chamaedorea sp., 50614.
geonomaeformis, 50520.
Chenopodium amaranticolor, 50137.
Chrysanthemum coronarium, 50451.
Chrysobalanus icaco, 50218.
Chrysophyllum spp., 50472, 50473.
cainito, 50471.
Chrysopogon aciculatus, 50355.
Cissus sp., 50474.
hypoglauca, 49871.

Citrullus vulgaris, 49872, 49873, 50138–50140, 50225, 50437.
Citrus spp., 49851, 50219, 50220.
hystrix, 50309.
nobilis deliciosa, 50326.
Clematis sp., 49905.
acthusifolia, 49934.
fargesii, 49935.
fusca, 49936.
gouriana, 50336.
integrifolia, 49809.
montana, 50337.
montevidensis, 50391.
rehderiana, 49937.
reitchiana, 49938.
viticella, 49810.
Cleome sp., 49993.
Clover, red, *Trifolium pratense*, 49884, 49888.
Cochlospermum hibiscoides. See *Maximilianea vitifolia*.
Coffea sp., 50633.
arabica columnaris, 50625.
maragogipe, 50626.
arnoldiana, 50627.
aruwimiensis, 50628.
canephora sankuruensis, 50629.
congensis chalotii, 50630.
dewevrei, 50631.
excelsa, 49962, 50141, 50632.
laurentii, 49963, 50142.
robusta. See *C. laurentii*.
Coffee. See *Coffea* spp.
Cohune, *Attalea cohune*, 50527.
Coix lacryma-jobi, 50143.
lacryma-jobi ma-yuen, 49798.
Cola sp. See *Bichea* sp.
Colocasia esculenta, 49824, 49826, 50583.
Combretum spp., 49964, 49994, 50144–50146.
Coral-bean tree, *Adenanthera pavonina*, 49955.
Coriander, *Coriandrum sativum*, 50452.
Coriandrum sativum, 50452.
Corn, *Zea mays*, 49882, 49974, 50044–50050, 50067, 50284–50286, 50358.
Cornus sp., 50409.
poliophylla, 40411.
walteri, 50410.
Cotoneaster zabeli, 50412, 50413.
Cotton, *Gossypium* spp., 49846, 50004–50006, 50214–50216, 50229–50231, 50581.
Couepia sp., 50592.
Couroupita guianensis, 50475.
Cowpea, *Vigna sinensis*, 50041, 50042, 50090, 50192, 50282, 50387.
Cracca spp., 49995, 49996.
candida, 50363.
Crataegus spp., 50414, 50415.
crenulata. See *Pyracantha crenulata*.
Crepis breviflora, 50352.
Crotalaria striata, 50226.
Cucumber, *Cucumis sativus*, 50636, 50637.
Cucumis melo, 50073.
sativus, 50636, 50637.
Cucurbita pepo, 49997, 50074, 50075.
Curcuma longa, 49877.
Custard-apple, *Annona reticulata*, 49980, 50211.
Cyamopsis psoraloides. See *C. tetragonoloba*.
tetragonoloba, 49864, 49899–49904.
Cyclamen rohlfsianum, 50529.
Cynodon incompletus. See *Capriola incompleta*.
Cyphomandra betacea, 49965.

Dactyloctenium aegyptium, 50227.
Dalbergia hupeana, 50416.
Dasheen, *Colocasia esculenta*, 50583.
Datura metel fastuosa, 50228.
stramonium, 50059.
Daucus carota, 49916.
Deutzia corymbosa, 49939.
longifolia, 49940.
veitchii, 49941.
mollis, 49942.
sieboldiana, 49943.
vilmorinae, 49944.
wilsoni, 49946.
Dichrostachys nutans. See *Cailliea nutans*.
Diervilla sessilifolia, 49945.
Dioscorea sp., 50055.
alata, 49825.
Diospyros lotus, 49883, 49906.
Diplorhynchus spp., 50147, 50148.
Docynia indica, 50364.
Dodonaea thunbergiana, 50399.
triquetra, 50400.
Doryanthes palmeri, 49859.
Dracaena sp., 49998.
Dracontium sp., 50476.
Duggena panamensis, 50586.

Echinochloa spp., 50477–50479.
pyramidalis, 49999.
stagnina, 49845.

Echinolaena polystachya, 50365.
Eggplant. *Solanum melongena*, 50035, 50054.
Elacis guineensis, 49878, 50000, 50634.
melanococca, 50480.
Elephantorrhiza burchellii. See *E. elephantina*.
elephantina, 50149.
Eleusine aegyptiaca. See *Dactyloctenium aegyptium*.
coracana, 49966, 50001, 50060.
Elm, *Ulmus pumila*, 50588, 50589.
Eragrostis curvula, 50150.
Eriobotrya japonica, 49840.
Eriodendron anfractuosum. See *Ceiba pentandra*.
Eriosema sp., 50002.
Erythrina caffra, 49817, 50151.
Ethulia conyzoides, 50003.
Eucalyptus sp., 49855.
alpina, 49860.
coccifera, 50208.
ficifolia, 49842.
muelleri, 50209.
tereticornis, 49856, 50347.
urnigera, 50210.
Eugenia glaucescens, 50392.
jambolana. See *Syzygium cumini*.
Euonymus sp., 50417.
giraldii, 50418.
ussuriensis, 50291.
Eupatorium oblongifolium, 50393.
Euterpe oleracea, 50481.

Fagopyrum esculentum. See *F. vulgare*.
vulgare, 50438.
Fennel, *Foeniculum vulgare*, 50453.
Ficus sp., 49849.
involucrata, 50396.
ribes, 50397.
variegata, 50398.
Fig. See *Ficus* spp.
Flax, *Linum* spp., 49898, 50160.
New Zealand, *Phormium tenax*, 50174.
Foeniculum vulgare, 50453.
Fraxinus floribunda, 50366.
Funtumia elastica, 50076.
Fusanus acuminatus. See *Mida acuminata*.

Garcinia sp., 50380.
Garlic, *Allium sativum*, 50582.
Gazania sp., 50152.
Geijera parviflora, 49892.
Gladiolus sp., 50056.
Gleditsia sinensis, 50638.
Gloriosa sp., 49874.
Glycine hispida. See *Soja max*.
Gnetum funiculare. See *G. indicum*.
indicum, 49799.
Gossypium spp., 49846, 50004–50006, 50215, 50216, 50229–50231, 50581.
hirsutum, 50214.
Gourd, *Lagenaria vulgaris*, 50157, 50333.
Grape, *Vitis* sp., 49823.
Grass, *Andropogon* spp., 50590, 50593, 50596.
Astrebla pectinata curvifolia, 50340.
triticoides, 50341.
barley, *Hordeum maritimum*, 49807.
Brachiaria brizantha, 49984.
Bromus macrostachys lanuginosus, 49805.
madritensis, 49806.
Chaetochloa sp., 49992.
Capriola incompleta, 50133.
Dactyloctenium aegyptium, 50227.
Echinochloa spp., 50477–50479.
pyramidalis, 49999.
stagnina, 49845.
Echinolaena polystachya, 50365.
Eragrostis curvula, 50150.
Heteropogon contortus, 50232.
Kamerun, *Holcus sorghum effusus*, 50010, 50011, 50077.
Lasiacis divaricata, 50616.
lovi-lovi, *Chrysopogon aciculatus*, 50355.
molasses, *Melinis minutiflora*, 50162.
Molinia caerulea, 50540.
Natal, *Tricholaena rosea*, 50038, 50280, 50281.
Panicum sp., 50064.
decompositum, 50342.
laevifolium, 50166.
maximum, 50081, 50244.
Paspalum dilatatum, 50335.
fasciculatum, 49865.
Pennisetum setosum, 50246, 50247.
sokwa, *Echinochloa stagnina*, 49845.
Sporobolus sp., 49821.
pyramidalis, 50037.
Syntherisma sanguinalis, 49814.
tabucki, *Holcus sorghum verticilliflorus*, 50008, 50009, 50012–50014, 50016, 50078, 50233, 50234.
Themeda gigantea villosa, 50372.
quadrivalvis, 50334.

Grass, *Trichopteryx diandra*, 50039.
Trisetum flavescens, 50542.
Tristachya biseriata, 49973.
Triticum cylindricum, 49804.
Grevillea banksii, 50332.
Grewia monticola, 50153, 50154.
parviflora, 50419.
Gruie, *Owenia acidula*, 49894.
Guar, *Cyamopsis tetragonoloba*, 49864, 49899–49904.
Guava, *Psidium guajava*, 50605.
Guilielma speciosa, 50482–50484.
Guizotia abyssinica, 50155.
Gymnocladus chinensis, 50454.

Hackberry, *Celtis* sp., 50408.
Hawthorn, *Crataegus* spp., 50414, 50415.
Helianthus annuus, 50639, 50640.
Heteropogon contortus, 50232.
Hibiscus sp., 50007.
esculentus. See *Abelmoschus esculentus*.
mutabilis, 50156.
Holcus sorghum, 49801–49803, 49967, 49968, 50015, 50017–50019, 50079, 50235, 50236, 50378, 50531.
sorghum effusus, 50010, 50011, 50077.
verticilliflorus, 50008, 50009, 50012–50014, 50016, 50078, 50233, 50234.
Honeysuckle, *Lonicera* spp., 49947, 50421.
Hordeum maritimum, 49807.
vulgare coeleste, 49808.
Hydrangea robusta, 50367.

Icaco, *Chrysobalanus icaco*, 50218.
Ilex sp., 50420.
Impatiens sp., 50062.
Indaiassu, *Astrocaryum* sp., 50591.
Indigo. See *Indigofera* spp.
Indigofera dosua, 50368.
dosua tomentosa, 50369.
Inula sp., 50020.
Ipomoea spp., 50308, 50310, 50615.
biloba. See *I. pes-caprae*.
pes-caprae, 50237.
Iriartea sp., 50485.
Iris sp., 49908.
dichotoma, 49907.

Jambolan, *Syzygium cumini*, 50525, 50608.
Jatropha curcas, 50021, 50239.
Job's-tears, *Coix lacryma-jobi*, 50143.
Juglans regia, 50641.
Jujube, *Ziziphus jujuba*, 49910, 50539.

Kapok, *Ceiba pentandra*, 50136, 50224.
Karroo bush, *Pentzia incana*, 49819.
Kigelia sp., 50022.
Koelreuteria apiculata, 50642.
Kokia drynarioides, 50624.
Kokio, *Kokia drynarioides*, 50624.

Lactuca sp., 50063.
sativa, 50455.
Lagenaria vulgaris, 50157, 50333.
Landolphia sp., 50158.
Lasiacis divaricata, 50616.
Lebbeck tree, *Albizzia lebbeck*, 49956.
Lebeckia sp., 49818.
Lecythis sp., 50486.
Leonotis sp., 50159.
Lettuce, *Lactuca sativa*, 50455.
Lilium philippinense, 50311.
Lily, Benguet. *Lilium philippinense*, 50311.
Linden, *Tilia* sp., 50432.
Linum narbonense, 49898.
usitatissimum, 50160.
Lobelia erinus microdon, 50161.
nicotianaefolia, 50314.
Lonicera sp., 50421.
alpigena, 49947.
Loquat, *Eriobotrya japonica*, 49840.
Lucuma macrocarpa, 50487.
rivicoa, 50488.
Luffa aegyptiaca. See *L. cylindrica*.
cylindrica, 50023.
Lycopersicon esculentum, 50024, 50240.

Malus sp., 50422.
thiefera, 50423, 50431.
Mamaca, undetermined, 50517.
Mammea americana, 50489.
Mamey, *Mammea americana*, 50489.
Manduro, *Balanites maughamii*, 50122.
Manihot esculenta, 49838, 50080, 50388.
glaziovii, 50241.
utilissima. See *M. esculenta*.
Manketti tree, *Ricinodendron rautanenii*, 50029.
Maple. See *Acer* spp.
Maximiliana sp., 50490.
Maximilianea vitifolia, 50602.
Ma-yuen. *Coix lacryma-jobi ma-yuen*, 49798.
Melinis minutiflora, 50162.
Melothria spp., 50025, 50026.

Mida acuminata, 49893, 50325.
Mikania amara, 50394.
Millet, pearl, *Pennisetum glaucum*, 50245.
ragi, *Eleusine coracana*, 49966, 50001, 50060.
Millettia megasperma, 50518.
Mimosa sp., 50603.
Mimusops zeyheri, 50163–50165.
Molinia caerulea, 50540.
Moraea sp., 50061.
Morning-glory. See *Ipomoea* spp.
Mu-oil tree, *Aleurites montana*, 50353.
Muskmelon. *Cucumis melo*, 50073.

Naranjilla, *Solanum quitoense*, 50607.
Nicotiana tabacum, 50242, 50312.
Nymphaea blanda, 50617.

Oats. *Avena sativa*, 50349–50351.
Okra, *Abelmoschus esculentus*, 49977.
Onion, *Allium cepa*, 49911, 50346.
Orbignya speciosa, 50594, 50595.
Oryza spp., 50493–50495.
latifolia, 50491.
sativa, 49879, 49880, 49969, 49970, 50492, 50587.
Oticia nuts, *Couepia* sp., 50592.
Owenia acidula, 49894.
Oxalis punctata glabrata, 49875.

Pacaya, *Chamaedorea* sp., 50614.
Pachylobus sp., 50243.
Pachyrhizus angulatus. See *Cacara erosa*.
Pai ts'ai, *Brassica pekinensis*, 49914, 49915, 50444–50449.
Palm, *Astrocaryum jauari*, 50468.
Chamaedorea geonomaeformis, 50520.
Elaeis melanococca, 50480.
Euterpe oleracea, 50481.
Iriartea sp., 50485.
macaúba, *Acrocomia sclerocarpa*, 50467.
Maximiliana sp., 50490.
oil, *Elaeis guineensis*, 49878, 50000, 50634.
Syagrus drudei, 50500.
Trachycarpus martianus, 50373.
Panicum sp., 50064.
brizanthum. See *Brachiaria brizantha*.
decompositum, 50342.
laevifolium, 50166.
maximum, 50081, 50244.
pyramidalis. See *Echinochloa pyramidalis*.
Papaya, *Carica papaya*, 50376.
Parinari mobola, 50167, 50168.
Paspalum dilatatum, 50335.
fasciculatum, 49865.
Passiflora foetida, 50618.
Pea, garden, *Pisum sativum*, 50176, 50269, 50457.
Peanut, *Arachis hypogaea*, 49844, 49876, 49981, 50382.
Pear. See *Pyrus* spp.
Peltophorum africanum. See *Baryxylum africanum*.
Pennisetum glaucum, 50245.
setosum, 50246, 50247.
typhoideum. See *P. glaucum*.
Pentaclethra macrophylla, 50082.
Pentzia incana, 49819.
Pepper, red, *Capsicum annuum*, 49988, 50223.
Perilla frutescens, 50456, 50532.
Persea americana, 50584, 50585.
gratissima. See *P. americana*.
Phaseolus acutifolius latifolius. 49820, 50169, 50170.
angularis, 50533.
aureus, 49857, 49917, 50171, 50248, 50249, 50348, 50384, 50534.
lunatus, 50217.
vulgaris, 50065, 50172, 50173, 50250–50267.
Philadelphus acuminatus, 49948.
lewisii, 49949.
pekinensis, 49950.
Phormium tenax, 50174.
Photinia sp., 50370.
Physalis sp., 50175.
angulata, 50268, 50496.
peruviana, 50027.
Pigeon-pea, *Cajan indicum*, 49850, 49986.
Pine, Chilgoza, *Pinus gerardiana*, 49889.
Pineapple, *Ananas sativus:*
(Belgian Kongo), 49835.
Cayena, 50528.
Guatemala Spineless White, 49861.
Mauritius, 49896.
Ruby, 49895.
Sarawak, 49897.
Pinus gerardiana, 49889.
Pistacia vera, 50057, 50058.
Pisum sativum, 50176, 50269, 50457.
Placus balsamifer, 50521.
Plectronia sp., 49971.
Poha, *Physalis peruviana*, 50027.
Potato, *Solanum tuberosum*, 50307, 50357.

Prosopis alba, 50092.
campestris, 50093.
chilensis, 50094.
denudans, 50095.
dulcis, 50096.
flexuosa, 50097.
juliflora. See *P. chilensis*.
nigra, 50098.
panta, 50099.
patagonica, 50100.
siliquastrum, 50101.
vidaliana, 50381.
Protea sp., 50028.
Prunus amygdalus. See *Amygdalus communis*.
serotina, 50604.
Pseudarthria hookeri, 50052.
Pseudolachnostylis sp., 50177.
Psidium guajava, 50605.
Pterocarpus sp., 50180.
angolensis, 50178.
sericeus, 50179.
Pueraria peduncularis, 50371.
Pumpkin, *Cucurbita pepo*, 49997.
Pupunha, *Guilielma speciosa*, 50482–50484.
Pyracantha crenulata, 50292.
Pyrus spp. 50543–50579.
calleryana, 49862.

Quamoclit pennata, 50238.
Quandong, *Mida acuminata*, 49893, 50325

Radish, *Raphanus sativus*, 50458–50465.
Ranunculus acris, 49811.
bulbosus, 49812.
glacialis, 49868.
Raphanus sativus, 50458–50465.
Raspberry, *Rubus* sp., 50619.
Rhamnus spp., 50424–50426, 50435.
Rhus spp., 50181, 50182.
potanini, 50519.
Rice, *Oryza sativa*, 49879, 49880, 50492.
kinyeki, 49969.
mutselu, 49970.
Yellow Early Ardizzone, 50587.
wild, *Oryza* spp., 50493–50495.
Oryza latifolia, 50491.
Ricinodendron sp., 50270.
rautanenii, 50029.
Ricinus communis, 50030, 50031, 50083, 50084, 50271–50277, 50643.
Rollinia mucosa, 50497.
Rosa sp., 50428.
banksiopsis, 50427.
glutinosa, 49951.
mollis, 49952.
serafinii, 49953.
webbiana, 49954.
Rose. See *Rosa* spp.
Rubber, Ceara. *Manihot glaziovii*, 50241.
Rubber tree, Lagos. *Funtumia elastica*, 50076.
Rubus spp., 50328–50330, 50619.
alleghaniensis, 50293.
biflorus quinqueflorus, 50294.
coreanus, 50295.
flosculosus, 50296.
giraldianus, 50297.
lasiostylus, 50298.
mesogaeus, 50299.
nigrobaccus. See *R. alleghaniensis*.
nutkanus, 50300.
parvifolius, 50301.
phoenicolasius, 50302.
pubescens, 50303.
ulmifolius, 50401.
veitchii, 50304.
xanthocarpus, 50305.

Saccharum officinarum, 49887, 50374, 50375, 50389, 50390.
Sage, *Salvia* sp., 50331.
Salvia sp., 50331.
Sapindus senegalensis, 50032.
Sapodilla, *Achras zapota*, 50466.
Sapote, white, *Casimiroa edulis*, 50379.
Scabiosa sp., 49909.
Schotia transvaalensis, 50183.
Sesame. See *Sesamum* spp.
Sesamum angolense, 50034.
orientale, 50033, 50085, 50086, 50439.
Sida rhombifolia, 50606.
Smilax sp., 50430.
aspera, 50402.
discotis concolor, 50429.
Soapberry, *Sapindus senegalensis*, 50032.
Soja max, 49828–49834, 49918–49920, 50385, 50440, 50441, 50522–50524, 50535, 50536.
Solanum spp., 49972, 50036, 50087, 50088, 50278, 50620.
melongena, 50035, 50054.
quitoense, 50607.
tuberosum, 50307, 50357.

Sorghum, *Holcus sorghum*, 49801–49803, 49967, 49968, 50015, 50017–50019, 50079, 50235, 50236, 50378, 50531
vulgare. See *Holcus sorghum*.
Sour plum, *Owenia acidula*, 49894.
Soursop, *Annona muricata*, 49978, 49979.
Spinach, *Spinacia oleracea*, 49921, 50644.
Spinacia oleracea, 49921, 50644.
Sporobolus sp., 49821.
pyramidalis, 50037.
Squash, *Cucurbita pepo*, 50074, 50075.
Stachys sieboldii, 50541.
Staphylea pinnata, 50306.
Stenocalyx sp., 50498.
Sterculia sp., 50184.
speciosa, 50499.
Stillingia sebifera, 50645.
Strychnos sp., 50185.
Sugar-apple, *Annona squamosa*, 50069, 50597.
Sugar cane, Crystalina, *Saccharum officinarum*, 50389.
Kavangire, *Saccharum officinarum*, 50390.
Shamsara, *Saccharum officinarum*, 50374.
Tani, *Holcus sorghum*, 50378.
Uba del Natal, *Saccharum officinarum*, 49887.
Vellai, *Saccharum officinarum*, 50375.
Sunflower, *Helianthus annuus*, 50639, 50640.
Swartzia madagascariensis. See *Tounatea madagascariensis*.
Syagrus drudei, 50500.
Syntherisma sanguinalis, 49814.
Syzygium cumini, 50525, 50608.

Tamarind, *Tamarindus indica*, 50186.
Tamarindus indica, 50186.
Tangerine, *Citrus nobilis deliciosa*, 50326.
Taro, *Colocasia esculenta*, 49824, 49826.
Tecoma sp., 50621.
Tephrosia candida. See *Cracca candida*.
Teramnus labialis, 50356.
Terminalia sericea, 50187, 50188.
Thalictrum angustifolium, 49869.
chelidonii, 50338.
elegans, 50339.
medium, 49813.
Thea sasanqua, 50646.
Themeda gigantea villosa, 50372.
quadrivalvis, 50334.
Theobroma spp., 50512–50515.
cacao, 50501–50505.
grandiflora, 50506–50508.
microcarpa, 50509.
speciosa, 50510, 50511.
Tilia sp., 50432.
Tithonia rotundifolia, 50279.
speciosa. See *T. rotundifolia*.
Tobacco, *Nicotiana tabacum*, 50242, 50312.
Tomato, *Lycopersicon esculentum*, 50024, 50240.
Toona sinensis, 50647.
Tounatea madagascariensis, 50189.
Trachycarpus martianus, 50373.
Tree-tomato, *Cyphomandra betacea*, 49965.
Tricholaena rosea, 50038, 50280, 50281.
Trichopteryx diandra, 50039.
Trichosanthes quinquangulata, 49858.
Trifolium pratense, 49884, 49888.
Trisetum flavescens, 50542.
Tristachya biseriata, 49973.
Triticum aestivum, 49800.
cylindricum, 49804.
vulgare. See *T. aestivum*.
Triumfetta rhomboidia, 50040.
Tung-oil tree, *Aleurites fordii*, 50635.
Turnip, *Brassica rapa*, 50450.

Uapaca sp., 50191.
sansibarica, 50190.
Ulmus pumila, 50588, 50589.
Undetermined, 49839, 49886, 49975, 49976, 50051, 50053, 50068, 50091, 50199–50206, 50287, 50516, 50517, 50622, 50623.
Urena lobata, 50089.

Vaccinium vitis-idaea, 50344.
Vangueria infausta, 49822.
Vetch, *Vicia* spp., 50315–50324.
Viburnum sp., 50433.
shensianum, 50434.
Vicia angustifolia, 50316.
atropurpurea, 50322.
bithynica, 50315.
dasycarpa, 50318.
sativa, 49885, 50317, 50319–50321.
sepium, 50323.
sylvatica, 50324.

Vigna spp., 50043, 50283.
cylindrica, 50537.
lutea, 49870.
retusa. See *V. lutea*.
sesquipedalis, 50377, 50386, 50538.
sinensis, 50041, 50042, 50090, 50192, 50282, 50387.
Vitex rehmanni, 50193.
Vitis sp., 49823.
hypoglauca. See *Cissus hypoglauca*.
Voandzeia subterranea, 49881.

Walnut, *Juglans regia*, 50641.
Water lily, *Nymphaea blanda*, 50617.
Watermelon, *Citrullus vulgaris*, 49872, 49873, 50138–50140, 50225, 50437.
Wheat, common. *Triticum aestivum*, 49800.
Whitewood, *Atalaya hemiglauca*, 49891.
Wilga, *Geijera parviflora*, 49892.

Yam, *Dioscorea* sp., 50055.
Dioscorea alata, 49825.

Zea mays, 49882, 49974, 50044–50050, 50067, 50284–50286, 50358.
Zelkova sinica, 50530.
Ziziphus spp., 50196–50198.
jujuba, 49910, 50539.
mucronata, 50194, 50195.
sativa. See *Z. jujuba*.
spina-christi, 50343.

Issued. May 14, 1923.

U. S. DEPARTMENT OF AGRICULTURE.
BUREAU OF PLANT INDUSTRY.

INVENTORY

OF

SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM JUNE 1 TO SEPTEMBER 30, 1920.

(No. 64: Nos. 50648 to 51357.)



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CONTENTS.

	Page.
Introductory statement	1
Inventory	7
Index of common and scientific names	91

ILLUSTRATIONS.

	Page.
PLATE I. A new and brilliant Hawaiian hibiscus. (*Hibiscus brackenridgei* A. Gray, S. P. I. No. 50693)	14
II. A Hawaiian hibiscus that should be widely cultivated. (*Hibiscus brackenridgei* A. Gray, S. P. I. No. 50693)	14
III. Preparing cassava roots in Tanganyika Territory. (*Manihot esculenta* Crantz, S. P. I. No. 50837)	30
IV. Types of eggplants from the Belgian Kongo. (*Solanum melongena* L., S. P. I. Nos. 50915 to 50918)	30
V. A wild avocado tree in Costa Rica. (*Persea* sp., probably *P. americana* Mill., S. P. I. No. 51031)	44
VI. The aguacate de anís, or wild avocado of Costa Rica. (*Persea* sp., probably *P. americana* Mill, S. P. I. No. 51031)	44
VII. The Bennett soursop, a choice variety from Costa Rica. (*Annona muricata* L., S. P. I. No. 51050)	48
VIII. A seedless form of the pejibaye, or peach palm, of Costa Rica. (*Guilielma utilis* Oerst, S. P. I. No. 51092)	48

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INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM JUNE 1 TO SEPTEMBER 30, 1920 (NO. 64; NOS. 50648 TO 51357).

INTRODUCTORY STATEMENT.

During the period covered by this inventory three agricultural explorers were in the field for the Bureau of Plant Industry. Wilson Popenoe finished his plant hunting in Guatemala and Costa Rica, and after a brief stay in the Canal Zone, commenced work in the Colombian highlands. Dr. H. L. Shantz was making his way through British East Africa, preparatory to coming down the Nile. Joseph F. Rock, who has joined the force of this office and has become an agricultural explorer for it, was on his way to Siam and Burma to search for seeds of the tree which yields the chaulmoogra oil that has proved so successful in the treatment of leprosy.

Mr. Rock sent in from the island of Oahu (Territory of Hawaii) a showy tree hibiscus (*Hibiscus brackenridgei*, No. 50693), bearing yellow flowers 6 inches across.

From Guatemala Mr. Popenoe sent in the zacate blanco (*Ixophorus unisetus*, No. 50650), one of the best native forage grasses for moist places such as the Everglades. From the region around El Barranquillo, Guatemala, which is exceedingly dry for a large part of the year, he sent a collection of flowering trees and shrubs which should find a home in southern Florida and California.

Mr. Popenoe also obtained seeds of a rare species of Persea (*P. caerulea*, No. 51032), related to the avocado, which bears racemes of black fruits the size of large peas. Whether or not this has value as a stock for the avocado remains to be seen. Certainly the avocado industry is becoming of such importance as to warrant the assembling of all the species of the genus Persea, to which the avocado belongs, preparatory to a systematic study of their possibilities for breeding purposes.

The pejibaye palm (*Guilielma utilis*), a very ancient food plant of Costa Rica, Mr. Popenoe thinks is remarkably promising. It

JUN 3 1925

is a slender palm which bears as much as 125 pounds of dry mealy fruits that, when boiled in salted water, resemble chestnuts in texture and flavor. It bears in 6 to 8 years, lives to be 50 years old, is the favorite vegetable fruit of the Costa Ricans, and a most important commercial product. Every attempt should be made, Mr. Popenoe thinks, to cultivate this in western Florida, where it may succeed. His discovery of seedless forms (Nos. 51091 and 51092) in Costa Rica is worthy of special mention; and we wish to record here our appreciation of the gifts of offshoots of these palms by Doña Amparo de Zeledón and by Alfredo Brade, as also the assistance rendered Mr. Popenoe, during his stay in Costa Rica, by Otón Jiménez, an active young botanist of San Jose.

From Zanzibar in June, 1920, Doctor Shantz shipped a most remarkable collection of 241 introductions (Nos. 50726 to 50966) obtained by him in the region of Nyanza, Lake Tanganyika, Dar es Salaam, Urundi, and Ujiji. These represent, in the main, varieties of the grain and vegetable crops of the native agricultural tribes of this interesting region, and out of the collection can hardly fail to come strains of sorghum, beans, corn, or other plants which, through breeding, will add to our own American varieties of these crops such characters as resistance to drought or disease.

The dahlia has become of such importance to our horticulture and there are so many breeders of it that a collection of tree dahlias (*Dahlia* spp., Nos. 51086 to 51090) from Costa Rica can scarcely fail to be of interest as material for breeding purposes.

Mr. Popenoe's wild raspberry (*Rubus eriocarpus*, No. 51094) from 10,000 feet altitude on the slopes of the Volcano Irazu may prove of value to breeders.

Ideal street trees are an asset to any country, and Mr. Popenoe, in getting seeds of the muñeco (*Cordia nitida*, No. 51118) of Costa Rica, may have introduced a valuable one for southern Florida.

The tacaco (*Polakowskia tacaco*, No. 51122), like the chayote of Guatemala, is a favorite vegetable among Costa Ricans and according to Mr. Popenoe deserves to be improved by selection.

From the well-known collector, Carlos Wercklé, Mr. Popenoe procured a new fruit tree of the genus Coccolobis (No. 50683) and an as yet undetermined fruit tree (No. 50692) which he thinks may be a new genus; both have tart edible fruits of some promise.

The new and handsome shrub (*Wercklea insignis*, Nos. 51124 and 51125), named for Mr. Wercklé and having bright-lilac flowers resembling in size and form the well-known *Hibiscus rosa-sinensis*, may grow in California and Florida and become popular.

From Bogota, Colombia, Mr. Popenoe sends a wild blackberry (*Rubus urticaefolius*, No. 51354), from an altitude of 5,000 feet, and *Erythrina edulis* (No. 51357), the seeds of which furnish an impor-

tant article of food on the western slopes of the Cordillera Oriental. These seeds are sometimes 2 inches long and when cooked are more agreeable in flavor and more delicate than the ordinary bean.

So little has been done in the way of selecting superior seedlings of the tropical fruits that Mr. Popenoe's discovery of a variety of the soursop (*Annona muricata*, No. 51050), which is more productive than the ordinary seedling and has unusually handsome fruits, will interest tropical horticulturists generally.

J. A. Hamilton, of Cairns, northern Queensland, Australia, believes his new Improved Dwarf Lima bean (*Phaseolus lunatus*, No. 50999) is better adapted to subtropical regions than Burpee's Bush Lima.

Dr. Proschowsky, of Nice, France, sends in *Alectryon subcinereum* (No. 51000), a relative of the lychee; he suggests that it may prove a good stock for that valuable Chinese fruit tree.

Mr. Macmillan sends in seeds of the giant bamboo (*Dendrocalamus giganteus*, No. 51026) of the Malay Peninsula, which grows more than 100 feet tall and 30 inches in circumference. As it seeds very infrequently, this variety should now be given a thorough trial in southern Florida.

Mr. Poynton, of Auckland, New Zealand, presents seeds of the pohutukawa tree (*Metrosideros tomentosa*, No. 51048) which grows on the shores of the North Island. Its thick evergreen leaves withstand salt spray remarkably well, and in the New Zealand summer the plant is covered with a profusion of scarlet blossoms. It should be useful on the shores of California.

There is something peculiarly romantic in Mr. Poynton's story of how the beautiful puka tree (*Meryta sinclairii*, No. 51049) of New Zealand was saved, after it had become so nearly extinct that there remained only 27 plants of it on some small islands in the Hauraki Gulf; all the trees now planted in the parks and gardens of that country came from cuttings of these specimens. It has the largest leaves of any plant in New Zealand.

Ornamental-berried house plants which will keep their freshness and their show of fruits for a long time are not common, and Mr. Johnson may have found a new one in his as yet undetermined species of Ardisia (No. 51052) from Alta Vera Paz, Guatemala. Mr. Johnson's introduction of two new species of the true pepper (Nos. 51059 and 51060), which have a slightly different flavor from that of the commercial species, *P. nigrum*, may have some economic importance for tropical horticulture.

The passifloras, or passion fruits, form a fascinating field for the plant breeder, and it is hard to understand why no one has studied them, especially since there are forms like *Passiflora macrocarpa*

(No. 51099) which bear delicious-flavored fruits the size of a man's head.

A new lawn grass (*Aeluropus brevifolius*, No. 51110) for alkaline soils will interest a wide circle of those who live in the Southwest, some of whom doubtless know its sender, Dr. R. H. Forbes, who lived in Arizona for many years before he went to Egypt.

A wild species of tulip (*Tulipa stellata*, No. 51113) from Punjab, India, with pure-white petals and bulbs which are frequently eaten by the East Indians, may interest the bulb growers and hybridizers.

Crotalarias appear to be excellent nitrogen gatherers in the sandy soils of Florida, and a new one (*Crotalaria verrucosa*, No. 51119) from Puntarenas, Costa Rica, is worthy of a fair trial.

The pandan has become so thoroughly at home in Florida that many horticulturists will be glad to try the four species (*Pandanus* spp., Nos. 51135 to 51138) sent in from Buitenzorg by the Java Department of Agriculture.

The accoub of Syria (*Gundelia tournefortii*, No. 51142) appears to be a promising new vegetable. It is a perennial spiny composite, similar to the globe artichoke but said to be superior to it.

The accounts of the mowra tree of India (*Madhuca indica*, No. 51155) are so remarkable that efforts ought to be made to establish this species on the dry waste lands of Florida, where its unusually sweet, edible blossoms could be utilized for alcohol manufacture. Single trees have been known to yield 300 pounds of flowers which yield from 40 to 70 per cent of invert and cane sugar mixed.

A collection of Wright's new peaches and apples (Nos. 51162 to 51179) from Auckland, New Zealand, including the Alpha apple, which he considers the earliest of all apples, will interest breeders of these fruits.

Wester sends in a new green-leafed vegetable for the South in his Talinum (No. 51193) a relative of purslane, which he reports makes an excellent dish for the table.

Bischofia trifoliata (No. 51194), the Javanese timber and shade tree, is proving such a beautiful thing in southern Florida that a distribution of it as a street tree is contemplated.

Eugenia curranii (No. 51201) from the Philippine Islands, according to Wester, bears immense quantities of fruits suitable for preserves.

The leaves and stems of a form of *Chenopodium album* (No. 51214), which is closely related to our own lamb's-quarters, according to Mr. Carter, of Calcutta, are used as greens in India, and the seeds are eaten as a cereal. The hill tribes of the western Himalayas cultivate this species as one of their principal crops.

Doctor Shantz finds the ati grass (*Heteropogon contortus*, No. 51226) of the region about Nairobi to be an excellent forage grass,

and recommends it for Arizona, New Mexico, and the pinelands of Florida. His hedge plant (*Coleus barbatus*, No. 51239), producing masses of sky-blue flowers, will be a desirable novelty if it proves hardy.

O. F. Cook has pointed out that we have in the driest desert region of California a leguminous tree (*Olneya tesota*, No. 51254), the beans of which when roasted resemble peanuts. These Olneya trees, as they are called, are among the most attractive trees of our Southwest. They deserve trial in other desert regions of the world.

The iburu (*Digitaria iburua*, No. 51257), a cereal grown by the natives of Northern Nigeria and producing a small, pure-white grain, is already under observation by Mr. Piper, who considers it worth while from the standpoint of a forage crop.

Perhaps the macui (*Solanum* sp., No. 51265) which Mr. Johnson finds in use among the Kekchi Indians of Alta Vera Paz, Guatemala, may be what we are looking for as a summer green vegetable for the South. He says the tender young tips are widely used and have an excellent flavor.

The fufu grass (*Pennisetum purpureum*, No. 51286), of Rhodesia, is found by Mr. Holland, of Port Elizabeth, South Africa, to be softer, sweeter, and more succulent than Napier grass, and this forage crop may prove superior to the latter in our Southern States.

The botanical determinations of seeds introduced have been made and the botanical nomenclature revised by H. C. Skeels, and the descriptive and botanical notes have been arranged by G. P. Van Eseltine, who has had general supervision of this inventory. The manuscript of this inventory has been prepared by Miss Esther A. Celander and Miss Patty T. Newbold.

DAVID FAIRCHILD,
Agricultural Explorer in Charge.

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION,
Washington, D. C., January 13, 1922.

INVENTORY.[1]

50648. SCHIZOSTACHYUM sp. Poaceæ. **Bamboo.**

From Buitenzorg, Java. Plants presented by Dr. J. C. Koningsberger, director, Java Botanic Garden, through K. Heyne, Department of Agriculture. Received June 8, 1920.

Late in 1915 L. C. Westenenk, a resident of Benkulen, Sumatra, while on a trip through the highlands of Kroe, found this solid-stemmed bamboo. Material was sent to the garden of the Museum of Economic Botany, in Buitenzorg, where it grew abundantly, flowered, and fruited. This bamboo forms a thick stand about 7 meters (24 feet) high; the green stems are 3 centimeters (more than an inch) thick, with joints about 25 centimeters (10 inches) long. (Adapted from *Teysmannia, vol. 30, p. 846.*)

50649 to 50651.

From the city of Guatemala, Guatemala. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 8, 1920. Quoted notes by Mr. Popenoe.

50649. ANANAS SATIVUS Schult. f. Bromeliaceæ. **Pineapple.**

"(No. 373.) Suckers of the *Montufar* pineapple, a variety grown in the lower Motagua Valley, notably at the station of Montufar, whence the name. The plants forwarded under this number were obtained from the grounds of the United Fruit Co. hospital at Quirigua.

"The plant is large and has slender, finely serrate leaves, not noticeably recurved. The fruits may be termed medium to large in size, being commonly 6 to 8 inches in length and oblong in form. The lines marking the carpellary divisions are not deeply incised, and the eyes, therefore, are not prominent. The surface is dull yellow in color, more commonly greenish yellow, because the fruits are not left on the plant until fully ripe. The flesh is light yellow, very juicy, with abundant aroma and rich flavor. It is not so delicately flavored nor so sweet as the *Smooth Cayenne*, but impresses me as considerably better than the *Red Spanish*. The variety is one which I have not seen elsewhere. It is forwarded for trial in connection with the Hawaiian experiments."

For previous introduction, see S. P. I. 49370.

[1] It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in these inventories are those which the material bore when received by the Office of Foreign Seed and Plant Introduction; and further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in these inventories, in many cases, will undoubtedly be changed by the specialists interested in the various groups of plants and the forms of the names brought into harmony with recognized American codes of nomenclature.

50649 to 50651—Continued.

50650. IXOPHORUS UNISETUS (Presl) Schlecht. Poaceæ. **Grass.**

"(No. 372a.) *Zacate blanco.* Seeds of a native grass from Quirigua in the lower Motagua Valley. Altitude, 250 feet.

"This is considered one of the best native forage grasses of its region. Its leaves, which are succulent and about half an inch wide, reach a height of about 2 feet. The plant seems to thrive in moist places and is worth testing in the Everglades region of southern Florida."

50651. PINUS OOCARPA Scheide. Pinaceæ. **Pine.**

"(No. 371a. Herb. No. 975.) From the Finca Moca, San Francisco Miramar, Patulul. Altitude about 3,200 feet. Seeds of a white pine, abundant on the lower slopes of the Volcano Atitlan. It yields good lumber and is cut for this purpose."

50652 to 50678.

From the city of Guatemala, Guatemala. Seeds collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 8, 1920. Quoted notes by Mr. Popenoe.

"(Nos. 345a to 370a. April 23, 1920.) The following have been collected at El Barranquillo. Many of these species I have seen in bloom and consider promising. Some of the others I have taken upon the recommendation of Fernando Carrera, who has collected the seeds.

"The region from which they come is exceedingly dry for a large part of the year, but is never cold; it does not seem certain, therefore, that these plants will stand the cold winters of California and Arizona, though they should be adapted to resist the dry atmosphere. It seems likely that most of them will succeed in southern Florida."

50652. ALVARADOA AMORPHOIDES Liebm. Simaroubaceæ.

"(No. 355a. Herb. No. 956.) *Plumajillo.* Described as a tree about 25 feet high, which produces an abundance of white flowers in January."

50653. CAESALPINIA EXOSTEMMA Moc. and Sesse. Cæsalpiniaceæ.

"(No. 350a. Herb. No. 974.) *Carcomo.* A leguminous shrub, reaching about 10 feet in height and producing terminal racemes of flowers somewhat resembling those of *Caesalpinia pulcherrima*, particularly in color, which is a combination of yellow and light orange-scarlet."

50654. CASSIA BICAPSULARIS L. Cæsalpiniaceæ.

"(No. 361a. Herb. No. 969.) *Cola de pato.* Described as a small tree which produces yellow flowers in March."

For previous introduction, see S. P. I. 44123.

50655. CASSIA EMARGINATA L. Cæsalpiniaceæ.

"(No. 362a. Herb. No. 959.) *Vainillo.* Described as a medium-sized tree which produces yellow flowers in March."

50656. CYDISTA PUBESCENS Blake. Bignoniaceæ.

"(No. 368a. Herb. No. 980.) *Campana.* Described as a vigorous climber which produces handsome pink flowers."

50657. EUPHORBIA LEUCOCEPHALA Lotsky. Euphorbiaceæ.

"(No. 359a.) *Flor de pascua.* Described as a small tree bearing white flowers at Christmas time (hence the name *flor de pascua*, or Christmas flower). Said to be particularly handsome."

50652 to 50678—Continued.

50658. MACROSCEPIS OBOVATA H. B. K. Asclepiadaceæ.

"(No. 336a. Herb. No. 970.) *Chununo.* Described as a climbing plant which produces reddish purple flowers in January."

50659. GUAIACUM GUATEMALENSE Planch. Zygophyllaceæ.

"(No. 364a. Herb. No. 952.) *Guayacan.* The Guatemalan lignum-vitæ, a small tree which is covered in February or March with lavender-blue flowers."

For previous introduction, see S. P. I. No. 47900.

50660. HAEMATOXYLUM BRASILETTO Karst. Cæsalpiniaceæ.

"(No. 348a. Herb. No. 936.) *Brazil.* A handsome flowering tree. It grows to about 15 feet in height, is spreading in habit, and during the early spring is covered with small yellow flowers."

For previous introduction, see S. P. I. No. 44456.

50661. IPOMOEA sp. Convolvulaceæ. Morning-glory.

"(No. 360a.) *Bejuco blanco.* A climber, said to produce large white flowers in December."

50662. JACQUINIA GRACILIS Mez. Theophrastaceæ.

"(No. 356a. Herb. No. 957.) *Duruche.* Described as a small tree, producing in January many fragrant yellow flowers."

50663. JACQUINIA GRACILIS Mez. Theophrastaceæ.

"(No. 356a.) *Duruche.* Described as a small tree, producing in January many fragrant yellow flowers."

50664. MAXIMILIANEA VITIFOLIA (Willd.) Krug and Urb. Cochlospermaceæ. (*Cochlospermum hibiscoides* Kunth.)

"(No. 346a.) *Tecomasuche.* A handsome plant, first introduced from Guatemala in 1917; but it has seemed worth while to obtain additional seed. In habit it is a small tree, with long, stiff unbranched growths from the main trunk, terminating in clusters of leaves which fall during the dry season and are replaced by clusters of flowers of the form and color of large California poppies (*Eschscholtzia californica*)."

For previous introduction, see S. P. I. 44821.

50665. PETREA ARBOREA H. B. K. Verbenaceæ.

"(No. 365a. Herb. No. 954.) *Cuero de zapo.* This is one of the finest flowering climbers of the Tropics. It is occasionally seen in southern Florida gardens, but is deserving of much wider cultivation in that region than it enjoys at present. It is a vigorous climber, with oblong leaves about 4 inches in length and harsh to the touch, and trusses of star-shaped flowers of sky-blue color. It blooms more or less throughout the year, but is fairly covered with flowers in the early spring."

For previous introduction, see S. P. I. No. 49031.

50666. PHYLLOCARPUS SEPTENTRIONALIS Donn. Smith. Cæsalpiniaceæ.

"(No. 345a.) *Flor de mico* (monkey flower). From El Barranquillo, Department of El Progreso, altitude about 1,800 feet. This unusually handsome flowering tree was introduced in 1917, but at that time only

50652 to 50678—Continued.

a small quantity of seed could be obtained. I have, therefore, obtained an additional supply, so that the species can be given a wide trial in the Tropics and Subtropics."

For previous introduction, see S. P. I. No. 44775.

50667. PLOCOSPERMA BUXIFOLIUM Benth. Loganiaceæ.

"(No. 357a. Herb. No. 972.) *Barreto.* Described as a small tree, reaching about 20 feet in height and producing in April small purple flowers."

50668. PLUMERIA ACUTIFOLIA Poir. Apocynaceæ.

"(No. 354a.) *Palo de la Cruz.* Known in English as frangipani, the source of the perfume of the same name. A stiff, erect, small tree, reaching about 25 feet in height, the branches naked except for clusters of leaves at the summit of each, where also appear in early spring clusters of single white, star-shaped flowers of delicious fragrance. This species is probably already known in Florida, as several plumerias are grown there to a limited extent; but it deserves much wider dissemination than has yet been given it in that State."

50669. PODOPTERUS GUATEMALENSIS Blake. Polygonaceæ.

"(No. 349a. Herb. No. 973.) *Cruzito.* A small tree or large shrub, which produces in February and March a profusion of small white flowers of peculiar form. A curious and beautiful plant."

50670. SAPINDUS SAPONARIA L. Sapindaceæ.

"(No. 352a.) *Jaboncillo.* One of the soapberries. See S. P. I. No. 49781 [324a]."

50671. SECURIDACA SYLVESTRIS Schlecht. Polygalaceæ.

"(No. 347a. Herb. No. 964.) *Choreque.* A vigorous climber, producing trusses of reddish purple flowers. A handsome thing."

50672. STIGMAPHYLLON sp. Malpighiaceæ.

"(No. 351a.) *Coralillo.* Said to be a red-flowered climbing plant. I am not familiar with it."

50673. TABEBUIA sp. Bignoniaceæ.

"(No. 366a.) *Cacho de chibo.* Described as a medium-sized tree producing small white flowers in January."

50674. VERNONIA PATENS H. B. K. Astèraceæ.

"(No. 358a. Herb. No. 960.) *Suquinay.* Described as an arborescent shrub, about 10 feet high, bearing many small white flowers about the first of March."

50675. (Undetermined.)

"(No. 369a.) *Granadillo.* Described as a medium-sized tree which produces in December an abundance of small white flowers."

50676. SIMAROUBA GLAUCA DC. Simaroubaceæ.

"(No. 353a. Herb. No. 982.) *Jocote mico.* Described as a small tree which produces attractive flowers followed by terminal racemes of plum-like fruits said to be edible."

50677. KARWINSKIA sp. Rhamnaceæ.

"(No. 370a.) *Manzanito.* Described as a medium-sized tree which produces small white flowers in January."

50652 to 50678—Continued.

50678. ASCLEPIAS CURASSAVICA L. Asclepiadaceæ.

"(No. 367a.) *Viborana.* Described as a small tree which produces small red flowers in March."

50679 to 50681.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 26, 1920. Quoted notes by Mr. Popenoe.

50679. GUILIELMA UTILIS Oerst. Phœnicaceæ. Palm.
(*Bactris utilis* Benth. and Hook.)

"(No. 391a. June 7, 1920.) *Pejibaye palm.* Seed of a remarkable food plant, of ancient cultivation in Costa Rica, and certainly deserving of wide dissemination in the Tropics. Pittier says: 'The Indians [of Costa Rica] have cultivated it since a remote period, and it is not now known in the wild state.' And Gagini quotes Alcedo to the effect that the fruit is almost the only food of the Guaimies and the Indians of southern Talamanca, in this country. It is to-day grown commercially in the vicinity of Tucurrique, on the Atlantic side, and is also known on the Pacific side, though not so abundant there. In the markets of San Jose the fruit is always in great demand and fetches a high price. The name is sometimes written *pejivalle*, *pijivay*, and *pixbay;* it is pronounced pe-he-vy-e, with the e's short.

"The palm is a beautiful pinnate-leaved species, with a slender trunk reaching to 50 feet, though commonly not more than 35 feet. The leaves resemble those of *Cocos plumosa* and other palms of that type, while the trunk is armed from top to bottom with thin, sharp spines about 2 inches long. Flowers are produced in spring, from March to June (occasionally at other times of the year), and are followed by stout racemes of fruit which matures principally in the autumn. The racemes sometimes weigh 25 pounds, and as many as five or six are produced by the palm in a single crop. The individual fruits are top shaped, up to 2 inches long, yellow to deep orange, with a thin skin, and a hard seed in the center surrounded by abundant flesh of orange or yellow color, firm texture, and dry, farinaceous character. Seedless varieties are known, and since these can be propagated, like date palms, by means of offshoots, of which the plant produces several in the course of its life, the establishment of superior forms should be simple.

"The pejibaye, which is one of the most popular of all Costa Rican fruits (though it should not, perhaps, be called a fruit, except in the botanical sense), is prepared for eating by boiling it for three hours in salted water, after which the skin is pared off with a knife, and the flesh, which strikingly resembles boiled chestnuts in appearance and flavor, is eaten without seasoning of any sort. Doubtless the fruit would lend itself to many uses, such as stuffing for fowl, but it is so good in its simple form that Costa Ricans have not sought to improve it by bringing it under the influence of the culinary art.

"The palm is said to come into bearing at 6 to 8 years from seed, and to live at least 50 years. It is found in Costa Rica from sea level up to 5,000 feet elevation, but in extremely wet regions above 4,000 feet some of the palms do not bear. The ideal region for it seems

50679 to 50681—Continued.

to be, in this country, between 2,000 and 3,000 or 3,500 feet and where the rainfall is not great. It does not appear to be particular as regards soil.

"The fruit contains about 40 per cent of carbohydrates, and according to an analysis made in San Jose, one pound of the flesh represents 1,096 calories of energy, which entitles the pejibaye to serious consideration as a food plant. All in all, it seems to me that it should be widely planted in tropical regions. In the United States, it may perhaps succeed in southern Florida, but the climate of California is probably too cool for it."

For previous introduction, see S. P. I. No. 44268.

50680. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

"(Nos. 382 and 395. May 27, 1920, and June 9, 1920. Cuttings of Avocado No. 42, from the residence of Margarita Muñoz, 4a Avenida Este and 5a Calle Sur, San Jose.) This avocado was called to my attention by Don Anastasio Alfaro, Director of the National Museum. He recommends it as one of the finest known to him, and a variety of unusually late ripening season. The parent tree, which stands in a small back yard, about 10 feet from a house, is 30 feet high, slender in form, with a straight trunk 15 inches thick at the base, branched 8 feet above the ground. At this time (June, 1920) the fruits are not half grown, but judging by their present appearance and a plaster of Paris model made last year by Sr. Alfaro, it is possible to say that the form is oval to broad pyriform and that it is up to one pound in weight. The color is said to be green, the seed not unreasonably large, and the flesh of excellent quality. The season of ripening is September to November, sometimes to December. Most of the avocados in this region ripen in August and September. The tree is a heavy bearer, the fruits sometimes being produced in clusters of two or three."

50681. RUBUS sp. Rosaceæ. **Blackberry.**

"(No. 390a. June 7, 1920.) A wild blackberry which occurs in the vicinity of San Jose. The seeds sent under this number are from fruits purchased in the market. This species produces fruits about an inch long, in form and general character resembling the cultivated blackberries of the North. The quality is fairly good, though the flavor is a trifle too acid. Of interest principally to those engaged in breeding new forms of blackberries."

50682 to 50685.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 15, 1920. Quoted notes by Mr. Popenoe.

50682. CHAYOTA EDULIS Jacq. Cucurbitaceæ. **Chayote.**
(*Sechium edule* Swartz.)

"(No. 380a. May 27, 1920.) A good variety of chayote from the San Jose market. The fruits are broadly obovoid in form, nearly round, about 3 inches long, and waxy white. There are a few short spines on the surface."

50682 to 50685—Continued.

50683. COCCOLOBIS sp. Polygonaceæ.

"(No. 376. May 27, 1920.) Plants presented by Carlos Werecklé, El Coyolar, Costa Rica. Mr. Werecklé described this as a small tree, evergreen, much branched, and handsome in appearance. It produces blue-black fruits the size of small plums, with juicy flesh of acid, somewhat astringent flavor, good for making jellies and preserves and also for eating out of hand when of a good variety. The single stone is rather large. This plant may succeed in southern Florida. It is from the lowlands of Costa Rica and hence tropical in its requirements."

50684. MARANTA sp. Marantaceæ.

"(No. 377. May 27, 1920.) *Lairen.* Roots presented by Carlos Werecklé, El Coyolar, Costa Rica. A plant allied to arrowroot and greatly resembling it in appearance. It yields large numbers of plump tubers, 2 to 4 inches long. These contain much starch, and can be eaten when boiled, though they never become soft or mealy. Mr. Werecklé thinks the species may be of value as a source of starch because of the large quantity of tubers which each plant produces."

50685. NECTANDRA GLABRESCENS Benth. Lauraceæ.

"(No. 379a. Seed from Rancho Redondo, near San Jose, elevation about 1,500 meters. May 27, 1920.) A round-topped tree growing to about 40 feet, and producing fruits which look like small avocados of the Mexican race. They are obovoid in form, nearly 2 inches long, with a thin black skin and yellow flesh of oily texture and strong aniselike taste which makes them inedible. Of interest as a possible stock plant for the avocado."

50686 and 50687.

From Kisantu, Belgian Kongo. Seeds presented by Father H. Vanderyst. Received June 29, 1920.

50686. ANDROPOGON sp. Poaceæ. Grass.

Numbered for convenience in testing by the Office of Forage-Crop Investigations.

50687. BRACHIARIA BRIZANTHA (Hochst.) Stapf. Poaceæ. Grass.
(*Panicum brizanthum* Hochst.)

"A tall grass, especially on the higher land. It is very abundant on the uplands and forms a large part of the great grass cover of this grassland country." (*Shantz.*)

For previous introduction, see S. P. I. No. 49687.

50688. PERSEA AMERICANA Mill. Lauraceæ. Avocado.
(*P. gratissima* Gaertn f.)

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 15, 1920.

"(No. 485.)" (*Popenoe.*)

50689 and 50690.

From Kisantu, Belgian Kongo. Seeds presented by Father H. Vanderyst. Received July 29, 1920.

50689. CHAETOCHLOA sp. Poaceæ. **Grass.**

Numbered for convenience in testing by the Office of Forage-Crop Investigations.

59690. CHAETOCHOLA LUTESCENS (Weigel) Stuntz. Poaceæ. **Grass.**

Numbered for convenience in testing by the Office of Forage-Crop Investigations.

50691 and 50692.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 15, 1920. Quoted notes by Mr. Popenoe.

50691. RUBUS GLAUCUS Benth. Rosaceæ. **Andes berry.**

"(No. 378a. Seed from Rancho Redondo, near San Jose. May 27, 1920. Herb. No. 988.) *Mora de Castilla.* This is either the same species sent from northern Guatemala under the name of *tokan-uuk*, or one of very similar character. The plant resembles the tokan-uuk very closely, and the fruit is of the same size and form but lighter in color, being of a light-red shade. It has a delicious aroma, suggesting strawberries. The fruit is oblong or somewhat ovate, up to an inch in length, very plump, soft and juicy when ripe. Several species of Rubus are given the common name *mora de Castilla:* this is used to indicate, in fact, any Rubus that produces good fruits of blackberry or raspberry character."

For previous introduction, see S. P. I. No. 49387.

50692. (Undetermined.)

"(No. 375a. May 27, 1920.) *Fruta de pava.* Plants presented by Carlos Wercklé, of El Coyolar, Costa Rica. A large tree native to this region. Mr. Wercklé believes it is a new species, perhaps representing a genus not yet described botanically. The fruit is about an inch long, shining black, with dark-purple flesh inclosing a single elongated stone. The flavor is agreeable, not sour but sometimes astringent. The young fruits are yellow, later turning red, then black. It is from the lowlands and likely to succeed in the United States only in southern Florida."

50693. HIBISCUS BRACKENRIDGEI A. Gray. Malvaceæ.

From Honolulu, Hawaii. Seed presented by J. F. Rock. Received June 30, 1920.

"A striking and well-marked rather rare species with a shrubby erect stem, 4 to 5 feet high, stiff spreading branches, and rather stout, very leafy flowering stalks. It is worthy of cultivation on account of its showy yellow flowers. The smooth, bright-green leaves on long petioles are rounded in outline, 3½ to 4 inches in diameter and 5 to 7-lobed, somewhat resembling those of the common grapevine. The spreading yellow corolla is about 6 inches across. Found in the scrub vegetation of the leeside of Oahu, East and West Maui, and Lanai." (*Rock.*)

A wild shrub of this species and a single flower are shown in Plates I and II.



A NEW AND BRILLIANT HAWAIIAN HIBISCUS. (HIBISCUS BRACKENRIDGEI A. GRAY, S. P. I. No. 50693.)

This extremely rare species of Hibiscus, which Mr. Rock found growing among the stones at the base of a cliff on the windward side of the island of Oahu, is a thing of rare beauty when covered with its large yellow flowers. Since it grows under arid and rather severe conditions it may be found useful as an ornamental plant in some parts of tropical America which, because of unfavorable climate and soil, are not well suited to the cultivation of many of the common tropical ornamentals. (Photographed by J. F. Rock, Oahu, Hawaii, March, 1918; P27003FS.)



A HAWAIIAN HIBISCUS THAT SHOULD BE WIDELY CULTIVATED. (HIBISCUS BRACKENRIDGEI A. GRAY, S. P. I. No. 50693.)

The deep canary-yellow flowers of this exceedingly rare Hibiscus are 6 inches across. Only a few wild plants are in existence (one is shown in Plate I), and the species seems not to have found its way into American horticulture, although Hillebrand called attention to the possibilities of its culture more than 30 years ago. (Photographed by J. F. Rock, Oahu, Hawaii, March, 1918; P27004FS.)

50694 to 50709.

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, Department of Botany and Forestry. Collected by A. Schwarz near Tjibodas, Java. Received June 29, 1920. Quoted notes by Mr. Schwarz.

50694. ALBIZZIA MONTANA (Jungh.) Benth. Mimosaceæ.

A shrub or small tree with spreading branches and oblong-linear silky pubescent or glabrous leaflets. The flowers are on very short pedicels in cylindrical spikes. The somewhat falcate pods contain brownish black seeds. Native to Java. (Adapted from *Valeton, Boomsoorten van Java, vol. 1, p. 295.*)

50695. ALTINGIA EXCELSA Noronha. Hamamelidaceæ.

"A magnificent tree of the tropical evergreen forests of the Indian Archipelago and northeastern India. In Java it yields in small quantity an odorous medicinal resin known in Europe as storax, which is obtained by incisions in the trunk; the tree is not regularly cultivated. The soft reddish gray wood with lighter streaks is used in Assam for building and ordinary domestic purposes." (*Watt, Dictionary of the Economic Products of India, vol. 1, p. 201.*)

50696. ELAEOCARPUS SPHAERICUS (Gaertn.) Schum. Elæocarpaceæ. (*E. ganitrus* Roxb.)

"*Djianitu.*"

A large tree found in Nepal, Assam, and the Konkan Ghats. The hard-grooved and elegantly tubercled nuts are polished and made into rosaries and bracelets. They are frequently set in gold and are often imported from Singapore, where the tree is common. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 3, p. 205.*)

50697. FICUS NOTA (Blanco) Merr. Moraceæ. **Fig.**

A medium-sized tree with broadly ovate leaves 15 to 25 centimeters long, more or less pubescent; numerous green or purplish, pear-shaped receptacles, 3 centimeters in diameter, are borne in masses on specialized leafless branches from the trunk and larger branches. This tree is common in the Philippine forests both in the lowlands and in the hills, reaching a height of 8 to 10 meters. The abundant milky sap when coagulated is similar in appearance and physical characteristics to the gum of *Achras zapota* (the gum chicle of commerce) which is used in the manufacture of chewing gum. (Adapted from *Merrill, New or Noteworthy Philippine Plants, No. 2, Bureau of Government Laboratories, No. 17, p. 10.*)

50698. FICUS ODORATA (Blanco) Merr. Moraceæ. **Fig.**

A Philippine tree, 15 to 18 feet high, marked by its peculiarly strongly inequilateral, very rough, fragrant leaves which are sublanceolate with a one-sided rounded margin at the base. It is not very well known. (Adapted from *Blanco, Flora de Filipinas, vol. 3, p. 89.*)

50699. FICUS ULMIFOLIA Lam. Moraceæ. **Fig.**

A Philippine plant with gray, woody branches covered at the tip with short rigid hairs. The ovate scaly leaves, unequally acuminate at base and tip, are sparsely bordered with shallow teeth which form remarkable sinuses at the summit. The globular, axillary fruits are mostly solitary and are the size of a small cherry or currant. (Adapted from *La Marck, Encyclopédie Méthodique Botanique, vol. 2, p. 499.*)

For previous introduction, see S. P. I. No. 35449.

50694 to 50709—Continued.

50700. FICUS sp. Moraceæ.

"(No. 1117.)"

50701. PARKIA TIMORIANA (DC.) Merr. Mimosaceæ. **Cupang.**
(*P. roxburghii* G. Don.)

"(No. 1183.)"

A huge and remarkably handsome quick-growing tree, attaining a height of 120 feet or more, with a clear smooth trunk and beautiful, fine-feathery pinnate leaves. Native to Malaya, Burma, etc., it has been introduced into and become well established in Ceylon, thriving in the moist low country up to 2,000 feet. The clusters of long pods contain a quantity of white, powdery, farinaceous substance. Easily propagated by seed. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting, p. 311.*)

For previous introduction, see S. P. I. No. 47948.

50702. PTEROSPERMUM sp. Sterculiaceæ.

"(No. 1182, from Siam.)"

50703. QUERCUS JAVANICA (Blume) Drake. Fagaceæ. **Oak.**

"(No. 1112.) *Passang batoe.*"

An exceedingly beautiful tree with oblong-lanceolate glabrous tawny leaves; the aments and young leaves are reddish tomentose. (Adapted from *Blume, Bijdragen tot de Flora van Nederlandsch Indië, vol. 1, p. 525.*)

50704. QUERCUS THELECARPA Miquel. Fagaceæ. **Oak.**

"(No. 1111.) *Passang soeroe.*"

A tree 25 meters tall with very smooth coriaceous leaves, shining above and glaucescent beneath. The cups of the sessile fruits are 12 millimeters high and 40 millimeters across. The thick hull is broadly ovate with a prominent graceful tip. The semiglobose acorn, 20 to 25 millimeters high, and 23 to 34 millimeters broad, is somewhat furrowed. Native to Java. (Adapted from *Valeton, Boomsoorten van Java, vol. 10, p. 28.*)

50705. QUERCUS sp. Fagaceæ. **Oak.**

"(No. 1110.) *Passang bodas.*"

50706. QUERCUS sp. Fagaceæ. **Oak.**

"(No. 1109.) *Passang djamba.*"

50707. QUERCUS sp. Fagaceæ. **Oak.**

"(No. 1113.) *Passang keyan* or *keang.*"

50708. QUERCUS sp. Fagaceæ. **Oak.**

"(No. 1114.) *Passang tonogo.*"

50709. SCHIMA NORONHAE Reinw. Theaceæ.

A tree 30 to 60 feet high, with elliptic-acute leaves 6 inches long, lead colored above. The white fragrant flowers are in a loose terminal corymb. Native to the eastern Indian Peninsula from Tenasserim to Penang. (Adapted from *Hooker, Flora of British India, vol. 1, p. 289.*)

50710. COLOCASIA sp. Araceæ. **Taro.**

From Quinto do Palheiro, Funchal, Madeira. Tubers presented by J. Erhest Blandy, American consul. Received June 18, 1920.

"*Igname branca*. A variety of taro apparently identical with the yellow tanyah grown in the coast regions of South Carolina and Georgia. The corms are intensely acrid in the raw state and require boiling for fully two hours to destroy this property and render them edible. They are of very pronounced flavor, but are preferred to most other taros by those who have acquired the taste for them. The buds are white, and the skin is without color beneath the brown fiber. It is of interest to note that the other taro, *igname vermelho*, cultivated in Madeira, is apparently identical with the blue tanyah of the South Atlantic States." (*R. A. Young.*)

For previous introduction, see S. P. I. No. 19996.

50711 to 50725.

From Darjiling, Bengal, India. Seeds presented by G. H. Cave, curator, Lloyd Botanic Garden. Received June 30, 1920.

50711. ACACIA CATECHU L. Mimosaceæ.

A moderate-sized deciduous tree, common in most parts of India and Burma, with dark-brown much-cracked bark, bipinnate leaves, and spikes of white or pale-yellow flowers. The plant yields a pale-yellow gum, and a dull-red dye can be obtained from a solution of catechu, the commercially important astringent resinous extract obtained from the chopped wood by boiling for 20 hours.

Kath, largely used as an ingredient in the betel-leaf preparation which the natives are so fond of chewing, is a crystalline substance deposited upon twigs placed in the boiling solution of chopped wood. It is the kath in combination with lime in the betel-leaf preparation which gives the teeth and lips the red color so characteristic of Hindus. Continued use blackens the teeth.

The sapwood is yellowish white; the heartwood is either dark or light red and extremely hard. The wood is very durable, seasons well, and takes a fine polish. It is not attacked by white ants or by teredo. It is used for agricultural implements and wheelwright work. The fuel of the dead trees is much valued by goldsmiths and is one of the best woods for making charcoal. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 27.*)

For previous introduction, see S. P. I. No. 45954.

50712. ALBIZZIA CHINENSIS (Osbeck) Merr. Mimosaceæ.
(*A. stipulata* Boiv.)

A shade tree of easy culture, which is a native of continental and insular southern Asia, extending to the Himalayas and China and ascending to altitudes of 4,000 feet. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 30.*)

For previous introduction, see S. P. I. No. 42356.

50713. ALBIZZIA LEBBECK (L.) Benth. Mimosaceæ. **Lebbeck tree.**

A large deciduous spreading ornamental tree exceedingly good for avenues. Its roots do not penetrate very deep. It grows in the evergreen mixed forests in the sub-Himalayas from the Indus River east-

50711 to 50725—Continued.

ward, in Bengal, Burma, central and southern India, ascending to 5,000 feet in altitude. The bark is used in tanning; and the oil extracted from the astringent seeds is considered useful in leprosy. The leaves are used for camel fodder, and the tree is often cultivated for this purpose. It may be propagated readily by cuttings, grows rapidly, and flourishes in almost any soil, especially on canal embankments and roadsides, affording both fodder and fuel where these are otherwise scarce. The sapwood is white, and the heartwood is dark brown, hard, shining, mottled, with deeper longitudinal streaks. It seasons, works, and polishes well, and is fairly durable. It is used for picture frames, sugar-cane crushers, furniture, buildings, canoes, and wheelwork. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 156.*)

For previous introduction, see S. P. I. No. 42809.

50714. ALNUS NEPALENSIS D. Don. Betulaceæ.

A deciduous tree with elliptic-lanceolate entire or subentire leaves and fruiting spikes in large erect panicles; the nutlets have a membranous wing. Native to the temperate Himalayas and the Khasi Hills. (Adapted from *Hooker, Flora of British India, vol. 5, p. 600.*)

For previous introduction, see S. P. I. No. 47635.

50715. BERBERIS NAPAULENSIS (DC.) Spreng. **Berberidaceæ. Barberry.**

A shrub, native to the temperate Himalayas and the Khasi Hills, 3 to 20 feet high, leafy near the top only. The bipinnate leaves are coriaceous and the erect racemes of fascicled yellow flowers are followed by bitter, violet-glaucous berries. (Adapted from *Hooker, Flora of British India, vol. 1, p. 109.*)

For previous introduction, see S. P. I. No. 47646.

50716. BOMBAX MALABARICUM DC. Bombacaceæ.

A very large deciduous tree with branches in whorls, spreading horizontally, and the stem with large thorny buttresses. It is native to the hotter forests of India and Burma, and is the largest and most characteristic tree of eastern Rajputana. The trunk and branches are covered with large corky prickles. The inner bark yields a good fiber, suitable for cordage; the seeds yield the so-called silk cotton, too short and too soft to be spun, but largely used for stuffing pillows, etc., and for gun cotton. The flower buds are eaten as a potherb. The leaves and twigs are lopped for fodder. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 156.*)

For previous introduction, see S. P. I. No. 48025.

50717. ERIOBOTRYA HOOKERIANA Decaisne. Malaceæ.

A small robust tree with elliptic-lanceolate coarsely serrate coriaceous leaves, thickly covered with rusty tomentum when young, glabrous when old. The panicles of white flowers are followed by yellow ellipsoid fruits, three-fourths of an inch long. Native to the eastern Himalayas, Sikkim, and Bhutan, at altitudes of 4,000 to 6,500 feet. (Adapted from *Hooker, Flora of British India, vol. 2, p. 371.*)

50718. LOBELIA ROSEA Wall. Campanulaceæ.

A tall suberect herb, 4 to 12 feet high, with short branches, horizontal with drooping tips, and narrowly lanceolate leaves, 6 inches long,

50711 to 50725—Continued.

velvety above. The rose or white flowers are crowded in short racemes. Native to the subtropical Himalayas from Kumaon to Bhutan, and the Khasi Hills at altitudes up to 4,000 feet. (Adapted from *Hooker, Flora of British India, vol. 3, p. 427.*)

For previous introduction, see S. P. I. No. 49648.

50719. MISCANTHUS NEPALENSIS (Trin.) Hack. Poaceæ. Grass.

A perennial grass with erect stems 3 to 6 feet high and linear leaves 6 to 18 inches long. The 1-flowered spikelets are partially enveloped in a tuft of long, silky, shining, golden yellow hairs. Native to the temperate Himalayas at altitudes of 5,000 to 8,000 feet, and to the Khasi and Naga Hills. (Adapted from *Collett, Flora Simlensis, p. 590.*)

For previous introduction, see S. P. I. No. 47735.

50720. MORUS INDICA L. Moraceæ. Mulberry.

A moderate-sized deciduous tree or shrub, found in the temperate Himalayas from Kashmir to Sikkim, ascending to 7,000 feet. It is largely cultivated in many parts of India for purposes of silk culture. The fiber was in very early times used by the Chinese for paper making and the twigs left by the silkworms and now thrown away might yield good half stuff for the paper maker. The fruit has an agreeable aromatic and acid flavor. The leaves are also valuable for fodder. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 5, p. 281.*)

50721. PYGEUM ACUMINATUM Colebr. Amygdalaceæ.

An evergreen tree with glabrous oblong-lanceolate leaves, 4 to 6 inches in length and equally long racemes of yellow-green flowers. The dark-purple drupe is 1 inch in diameter. Native to eastern Bengal and the Khasi Hills. (Adapted from *Hooker, Flora of British India, vol. 2, p. 318.*)

50722. QUERCUS INCANA Roxb. Fagaceæ. Oak.

A large evergreen tree found on the temperate Himalayas from the Indus River to Nepal, between altitudes of 3,000 and 8,000 feet. In spring it becomes purplish owing to the brush of fresh new leaves, which are softly tomentose. The bark yields a small quantity of a reddish fawn coloring matter which can be used in dyeing silk and cotton. The galls are used in the Punjab for dyeing hair. The bark is extensively employed for tanning purposes. The acorns form the astringent medicine known in the Punjab bazaars as balût; they are greedily eaten by monkeys and bears. The leaves are extensively lopped for fodder. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 6, pt. 1, p. 382.*)

50723. RUBUS ROSAEFOLIUS J. E. Smith. Rosaceæ.

An erect, branching Himalayan shrub which is very attractive because of its evergreen foliage, delicate white flowers, and especially its bright-red fruits, charming to the eye but rather insipid to the taste. (Adapted from *Curtis's Botanical Magazine, pl. 6970.*)

For previous introduction, see S. P. I. No. 39658.

50724. SAPINDUS MUKOROSSI Gaertn. Sapindaceæ. Soapberry.

A tree 60 to 80 feet high, known as the *hou-erh-tsao*, which occurs throughout the Yangtze Valley up to altitudes of 3,000 feet. The

50711 to 50725—Continued.

panicles of flowers are followed by shining brown, globose fruits about the size of large marbles. The fruits are used for washing white clothes, being considered for this purpose superior to Gleditsia pods. (Adapted from *Wilson, A Naturalist in Western China, vol. 2, p. 72.*)

For previous introduction, see S. P. I. No. 26280.

50725. SPATHOLOBUS PARVIFLORUS (Roxb.) Kuntze. Fabaceæ.
(*S. roxburghii* Benth.)

A gigantic climber common in the forests of the lower Himalayas in northeastern India and in Ceylon. A red gum resembling kino exudes from this plant; the seeds yield an oil used for cooking and for annointing purposes. A fiber obtained from the bark is twisted into ropes and bowstrings. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 6, pt. 3, p. 319.*

50726 to 50966.

From Zanzibar, Zanzibar. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received June 8, 1920. Quoted notes by Doctor Shantz.

50726. AMARANTHUS sp. Amaranthaceæ. **Amaranth.**

"(No. 871. Nyanza, Urundi. March 19, 1920.) The leaves constitute the African spinach extensively eaten by natives and Europeans. Grown about every cabin."

50727. ANANAS SATIVUS Schult. f. Bromeliaceæ. **Pineapple.**

"(No. 941. Zanzibar, Zanzibar. April 6, 1920.) A large type; not grown very extensively near Zanzibar."

50728. ANNONA MURICATA L. Annonaceæ. **Soursop.**

"(No. 624. Kigoma, Tanganyika Territory. February 20, 1920.) Probably the same as No. 511 and 527 [S. P. I. Nos. 35695 and 49979]. It is grown in many places and yields a heavy crop."

50729 and 50730. ANNONA RETICULATA L. Annonaceæ. **Custard-apple.**

50729. "(No. 620. Kigoma. February 20, 1920.) Probably the same as sent before. This fruit is planted almost everywhere in the European settlements. It is probably less abundant than the soursop."

For previous introduction, see S. P. I. No. 49289.

50730. "(No. 869. Nyanza, Urundi. March 19, 1920.) Locally they often turn dark blue and dry up without ripening, due to drought."

50731. ANNONA SENEGALENSIS Pers. Annonaceæ.

"(No. 667. M'Sala, Urundi. February 24, 1920.) Seed from an old fruit. I have had no opportunity to test this fruit. Leaves very large and broad."

For previous introduction, see S. P. I. No. 38525.

50732. ARACHIS HYPOGAEA L. Fabaceæ. **Peanut.**

"(No. 639. Kigoma. February 21, 1920.) Peanuts. They are grown everywhere with corn, manihot, etc. A very important element of diet; much more widely grown than Voandzeia."

50726 to 50966—Continued.

50733. ARECA CATECHU L. Phœnicaceæ. **Betel-nut palm.**

"(No. 924. Malongwe, Tanganyika Territory. March 29, 1920.) The nut is chewed by almost everyone with pepper leaf, tobacco, lime, and gambier."

For previous introduction, see S. P. I. No. 45478.

50734. BAUHINIA KAPPLERI Sagot. Cæsalpiniaceæ.

"(No. 918. Tabora, Tanganyika Territory. March 27, 1920.) A handsome pink-flowered tree, like a mopaine [*Copaira mopane*] with long pods (6 inches) and small seeds buried in flour."

50735. BYRSOCARPUS sp. Connaraceæ.

"(No. 698. Nyanza, Urundi. February 29, 1920. Herb. No. 692.) A beautiful small shrub with highly ornamental ripe pod and seed."

50736 to 50738. CAJAN INDICUM Spreng. Fabaceæ. **Pigeon-pea.**

50736. "(No. 660. M'Sala. February 24, 1920 Herb. No. 680.) A tall pea same as No. 531 [S. P. I. No. 49986] and grown by all natives both in the Kongo and about Lake Tanganyika. Usually eaten as a green pea; grows on woody bush 6 to 8 feet high."

50737. "(No. 930. Dar es Salaam, Tanganyika Territory. April 1, 1920.) A gray or light chocolate pigeon-pea."

50738. "(No. 934. Zanzibar. April 6, 1920.) Pigeon-pea similar to No. 930 [S. P. I. No. 50737]."

50739. CANAVALI GLADIATUM (Jacq.) DC. Fabaceæ. **Sword bean.**

"(No. 910. Kigoma. March 26, 1920.) A very large red bean, many in a pod. From gardens."

For previous introduction, see S. P. I. No. 44806.

50740. CANNA sp. Cannaceæ. **Canna.**

"(No. 708. Nyanza, Urundi. March 2, 1920.) Abundant in the Kongo and occasional here. Seed used in rattles at the dances, which seems to be its chief use by the natives."

50741. CANNA sp. Cannaceæ. **Canna.**

"(No. 868. Nyanza, Urundi. March 19, 1920.) Red canna; seeds used in rattles for dancing."

50742 and 50743. CAPSICUM ANNUUM L. Solanaceæ. **Red pepper.**

50742. "(No. 626. Kigoma. February 20, 1920.) A long red pepper, the principal type grown here. It is one-eighth of an inch in diameter."

50743. "(No. 627. Kigoma. February 20, 1920.) A small red pepper, globular, and about one-fourth of an inch in diameter."

50744. CASSIA SIAMEA Lam. Cæsalpiniaceæ.

"(No. 643. Ujiji, Tanganyika Territory. February 22, 1920. Herb. No. 676.) One of the principal street trees."

For previous introduction, see S. P. I. No. 42362.

50745 and 50746. CEIBA PENTANDRA (L.) Gaertn. Bombacaceæ. **Kapok.**
(*Eriodendron anfractuosum* DC.)

50726 to 50966—Continued.

50745. "(No. 673. Nyanza, Urundi. February 27, 1920.) Trees planted along the walks; also used as a street tree in towns. These trees are branched from the base and have very smooth green bark. The cotton is not used by the natives."

For previous introduction, see S. P. I. No. 49442.

50746. "(No. 765. Nyanza, Urundi. March 9, 1920.) Bombax or kapok, a very attractive street tree with green bark and leaves like Manihot. This tree was planted everywhere by the Germans and they are supposed to have perfected machinery to weave the silk cotton into cloth."

50747. CISSUS sp. Vitaceæ.

"(No. 776. Nyanza, Urundi. March 9, 1920. Herb. No. 706.) An ampelopsis or grapelike vine; a few dark fruits."

50748. CLEMATIS sp. Ranunculaceæ. Clematis.

"(No. 848. N'gano N'gano, Urundi. March 17, 1920.) A low herb-like clematis."

50749. CRACCA POLYSTACHYA (E. Mey.) Kuntze. Fabaceæ.
(*Tephrosia polystachya* E. Mey.)

"(No. 697. Nyanza, Urundi. February 29, 1920. Herb. No. 693.) A legume with pink flowers and small hairy pods."

50750. CRACCA sp. Fabaceæ.

"(No. 731. M'Sala, Urundi. March 7, 1920. Herb. No. 704.) A small wild bean very abundant on sandy soil."

50751. CROTALARIA STRIATA Schrank. Fabaceæ.

"(No. 678. Nyanza, Urundi. February 28, 1920.) A plant with very small flowers arranged in spikes."

For previous introduction, see S. P. I. No. 34670.

50752. CROTALARIA sp. Fabaceæ.

"(No. 661. Nyanza, Urundi. February 26, 1920. Herb. No. 709.) A tall yellow-flowered attractive crotalaria which bears a heavy crop of seed and may be valuable as a green manure or as a fiber plant."

50753. CROTALARIA sp. Fabaceæ.

"(No. 671. M'Sala, February 24, 1920.) An unusually prolific and large-podded crotalaria, probably the same as No. 661 [S. P. I. No. 50752] or No. 672 [S. P. I. No. 50754]."

50754. CROTALARIA sp. Fabaceæ.

"(No. 672. M'Sala, February 24, 1920.) With smaller pod, but a very heavy yield. Similar to No. 671 [S. P. I. No. 50753]. I have not seen these plants used here by the natives, but they have ornamental value if no other."

50726 to 50966—Continued.

50755 to 50757. CUCUMIS SATIVUS L. Cucurbitaceæ. **Cucumber.**

50755. "(No. 641. Ujiji. February 22, 1920.) A large cucumber, 8 inches long and 4 inches in diameter, of very good flavor. It looks more like a squash. I have been unable to get a thoroughly ripe fruit. These seeds are somewhat immature."

50756. "(No. 925. Malongwe. March 29, 1920.) A brown-skinned cucumber."

50757. "(No. 926. Malongwe. March 29, 1920.) Coat yellow with dark-green streaks."

50758. CUCURBITA PEPO L. Cucurbitaceæ. **Pumpkin.**

"(No. 631. Kigoma, Tanganyika Territory. February 2, 1920.) A sweet, green pumpkin, prized locally."

50759. CYMBOPOGON sp. Poaceæ. **Grass.**

"(No. 846. N'gano N'gano, Urundi. March 17, 1920.) A small Andropogonlike or Stipalike grass about 15 inches high, one of the good cattle grasses. Should do well in the mountain country of Arizona, New Mexico, Oregon, Washington, and California."

50760. DOLICHOS LABLAB L. Fabaceæ. **Bonavist bean.**

"(No. 701. Nayanza, Urundi. February 29, 1920. Herb. No. 701.) A bean which forms a long vine and grows abundantly on waste land. It is somewhat ornamental."

50761. DOLICHOLUS sp. Fabaceæ.

"(No. 704. Nyanza, Urundi. February 29, 1920.) A coarse beanlike vine with peculiar small blue seeds."

50762. ELAEIS GUINEENSIS Jacq. Phœnicaceæ. **Oil palm.**

"(No. 628. Kigoma, Tanganyika Territory. February 20, 1920.) The oil palm; planted extensively everywhere here. It is an important food plant."

50763. ELEUSINE CORACANA (L.) Gaertn. Poaceæ. **Ragi millet.**

"(No. 866. N'gano N'gano, Urundi. March 18, 1920.) A grain crop of the Urundi Mountains."

For previous introductions, see S. P. I. No. 48456.

50764 and 50765. ERAGROSTIS TREMULA Hochst. Poaceæ. **Grass.**

50764. "(No. 644. Ujiji. February 22, 1920.) A grass which grows well as a ruderal."

50765. "(No. 645. Ujiji. February 22, 1920. Herb. No. 677.) Similar to No. 644 [S. P. I. No. 50764], taller."

50766. ERAGROSTIS sp. Poaceæ. **Grass.**

"(No. 839. N'gano N'gano, Urundi. March 5, 1920. Herb. No. 714.) A semiruderal grass which may be a good forage plant."

50767. ERAGROSTIS sp. Poaceæ. **Grass.**

"(No. 851. N'gano N'gano, Urundi. March 17, 1920.) A grass similar to *Eragrostis major*. Abundant, but never very important in natural sod."

50726 to 50966—Continued.

50768. ERYTHRINA sp. Fabaceæ.

"(No. 777. Nyanza, Urundi. March 9, 1920. Herb. No. 705.) An ornamental tree with a red bean, probably the same as No. 347 [S. P. I. No. 49588]. Planted as a windbreak and as an ornamental."

50769. FICUS sp. Moraceæ. **Fig.**

"(No. 861. N'gano N'gano, Urundi. March 18, 1920.) A small fig eaten by the natives. Plant about 1 foot high."

50770. GLADIOLUS sp. Iridaceæ. **Gladiolus.**

"(No. 665. M'Sala. February 24, 1920.) A few seed."

50771. GLADIOLUS sp. Iridaceæ. **Gladiolus.**

"(No. 863. N'gano N'gano, Urundi. March 18, 1920.) Blue gladiolus with two small reddish spots on the side petals. A very handsome flower."

50772. GLADIOLUS sp. Iridaceæ. **Gladiolus.**

"(No. 864. N'gano N'gano, Urundi. March 18, 1920.) Red mottled or streaked over yellow."

50773. GLORIOSA sp. Melanthaceæ.

"(No. 666. Nyanza, Urundi. February 26, 1920.) Seed of a lilylike plant. No flowers seen."

50774. GOMPHOCARPUS PHYSOCARPUS E. Mey. Asclepiadaceæ.

"(No. 729. M'Sala, Urundi. March 7, 1920. Herb. No. 703.) An attractive asclepiad which may have value as a fiber plant."

50775. GOSSYPIUM sp. Malvaceæ. **Kidney cotton.**

"(No. 646. Ujiji. February 22, 1920.) The type grown by the natives. The seeds stick together and can be removed from the lint without becoming separated."

50776. GOSSYPIUM sp. Malvaceæ. **Kidney cotton.**

"(No. 670. Nyanza, Urundi. February 26, 1920.) Cotton seed secured near a native hut. Lint and pod sent in. This is the principal type grown by the natives."

50777. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"(No. 700. Nyanza, Urundi. February 29, 1920.) Sent to Chef de Poste for planting. A pink boll weevil is abundant here in native cotton. I know nothing about this variety."

50778. GOSSYPIUM sp. Malvaceæ. **Kidney cotton.**

"(No. 763. Nyanza, Urundi. March 9, 1920.) Seeds remain together; leaf, flower, and pod like *Egyptian*. A low plant, about 3 feet high, and yields a very heavy crop of cotton. One of the best plants I have seen. Boll-weevil damage noticeable."

50726 to 50966—Continued.

50779 to 50829. HOLCUS spp. Poaceæ.

50779. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

"(No. 735. Nyanza, Urundi. March 7, 1920.) A collection of seeds from many different plants. It should all be planted and the different forms (if any) segregated. Collected from hundreds of plants."

50780. HOLCUS SORGHUM SUDANENSIS (Piper) Hitchc. Poaceæ.
Sudan grass.

"(No. 657. M'Sala near Nyanza, 60 kilometers north of Kigoma. February 24, 1920. Herb. No. 679.) Sudan grass grows abundantly here. The plants are 6 to 10 feet tall."

50781 to 50808. "(Nyanza, Urundi. March 7, 1920.) The following numbers are heads of *Holcus*. The measurements here given are: (1) Height of plant, in meters; (2) heads, in centimeters (two or more measurements mean that there were that number of heads); (3) number of nodes; and (4) number of branches. The branching indicated as 4+1 means branched at fourth node below the top one."

50781. HOLCUS SORGHUM SUDANENSIS (Piper) Hitchc. Poaceæ.
Sudan grass.

"(No. 709.) Measurements: (1) 3.35, (2) 45, (3) 13, (4) 0."

50782 and 50783. HOLCUS SORGHUM EFFUSUS (Hack.) Hitchc. Poaceæ.

50782. "(No. 710.) Measurements: (1) 4.39, (2) 39, (3) 16, (4) 0."
Kamerun grass.

50783. "(No. 711.) Measurements: (1) 4.42, (2) 46, (3) 15, (4) 0."

50784. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

"(No. 712.) Measurements: (1) 3.44, (2) 37, (3) 14, (4) 0."

50785. HOLCUS SORGHUM EFFUSUS (Hack.) Hitchc. Poaceæ.
Kamerun grass.

"(No. 713.) Measurements: (1) 3.97, (2) 43, (3) 18, (4) 0."

50786 to 50788. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

50786. "(No. 714.) Measurements: (1) 4.22, (2) 42, (3) 17, (4) 0."

50787. "(No. 715.) Measurements: (1) 4.08, (2) 42, (3) 19, (4) 5+1."

50788. "(No. 716.) Measurements: (1) 3.80, (2) 39, (3) 13, (4) 5+1; not matured."

50789. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc. Poaceæ. **Tabucki grass.**

"(No. 717.) Measurements: (1) 3.67, (2) 38, (3) 22, (4) 31; roots are nine nodes at base."

50726 to 50966—Continued.

50790. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

"(No. 718.) Measurements: (1) 3.45, (2) 29, (3) 12, (4) 2+1; three heads from two branches."

50791 to 50794. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Poaceæ. **Tabucki grass.**

50791. "(No. 719.) Measurements: (1) 4.22, (2) 41, (3) 16, (4) 4+1."

50792. "(No. 720.) Measurements: (1) 2.53, (2) 44, (3) 10, (4) 3+1."

50793. "(No. 721.) Measurements: (1) 3.67, (2) 42, (3) 24, (4) 4+1; heads on each branch."

50794. "(No. 722.) Measurements: (1) 3, (2) 39, (3) 16, (4) 2+1; larger branch from sixth node."

50795. HOLCUS SORGHUM EFFUSUS (Hack.) Hitchc. Poaceæ. **Kamerun grass.**

"(No. 723.) Measurements: (1) 4.50, (2) 45, (3) 18, (4) 3; heads."

50796. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc. Poaceæ. **Tabucki grass.**

"(No. 724.) Measurements: (1) 3.25, (2) 45, (3) 12, (4) 4+1; larger branches from first four nodes above ground."

50797. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

"(No. 725.) Measurements: (1) 4.56, (2) 42, (3) 17; branches from nodes 1, 2, 4, 5, 6, 11, 12, 13, 14, 15."

50798. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc. Poaceæ. **Tabucki grass.**

"(No. 726.) Measurements: (1) 4.09, (2) 48, 40, 43, 30, 36, 30, 36; (3) 15; seven heads on branches measured from top to bottom."

50799. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

(No. 727a.) Received without notes, but apparently belonging with the preceding collection.

50800. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc. Poaceæ. **Tabucki grass.**

"(No. 734.) Wild sorghum."

50801 and 50802. HOLCUS SORGHUM EFFUSUS (Hack.) Hitchc. Poaceæ. **Kamerun grass.**

50801. "(No. 762. Nyanza, Urundi. March 9, 1920.) A type in which the heads do not fully emerge from the upper sheath."

50802. "(No. 769. Nyanza, Urundi. March 9, 1920.) Two unusually large heads of wild sorghum; grown in a field of kafir."

50726 to 50966—Continued.

50803. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc. Poaceæ. **Tabucki grass.**

"(No. 841. N'gano N'gano, Urundi. March 15, 1920.) A tall, upright, large-fruited type of wild sorghum; good type."

50804 to 50806. HOLCUS SORGHUM L. Poaceæ. Sorghum. (*Sorghum vulgare* Pers.)

50804. "(No. 842. N'gano N'gano, Urundi. March 15, 1920.) Should be studied; a heavy-seeded form."

50805. "(No. 843. N'gano N'gano, Urundi. March 15, 1920.) Low plant; heavy seed crop."

50806. "(No. 844. N'gano N'gano, Urundi. March 15, 1920.) Similar to No. 843 [S. P. I. No. 50805]; very heavy seed crop."

50807 and 50808. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc.. Poaceæ. **Tabucki grass.**

50807. "(No. 870. Nyanza, Urundi. March 19, 1920.) Seed from hundreds of wild plants of various size and habit; an examination of the seed will give a fair idea of variation in flower structure."

50808. "(No. 900. Nyanza, Urundi. March 21, 1920.) A collection of heads; could not be sent in separately for lack of envelopes."

50809 to 50829. HOLCUS SORGHUM L. Poaceæ. Sorghum. (*Sorghum vulgare* Pers.)

50809. "(No. 901. Nyanza, Urundi. March 21, 1920.) May be sterile kafir heads."

50810. "(No. 638. Kigoma. February 21, 1920.) White kafir from the market."

50811. "(No. 653. Ujiji. February 22, 1920.) A white kafir."

50812. "(No. 654. Ujiji. February 22, 1920.) Similar to No. 653 [S. P. I. No. 50811]; a pure white strain."

50813. "(No. 656. Ujiji. February 22, 1920.) A red or pinkish brown kafir. Well-shaped head and apparently much grown in this section, known as *Konge*, but not as well liked by the natives as *m'tama*, the white form."

50814. "(No. 658. Ujiji. February 22, 1920.) Red kafir, larger than No. 656 [S. P. I. No. 50813] but very similar."

50815. "(No. 659. Ujiji. February 22, 1920.) A variety probably identical with Nos. 656 and 658 [S. P. I. Nos. 50813 and 50814]."

50816. "(No. 668. Nyanza, Urundi. February 26, 1920.) Kafir, two heads collected near a native hut. It is grown everywhere here, but the seeds are usually eaten out by birds."

50817. "(No. 669. Nyanza, Urundi. February 26, 1920.) A rather heavy head of kafir; may be distinct from the others. I have seen no gooseneck forms."

50726 to 50966—Continued.

50818. "(No. 674. Nyanza, Urundi. February 27, 1920.) Deep red kafir known as *Conge* or *Konge*. This head is large, branches somewhat like broom corn, and has two seeds in each flower. This type may be especially interesting."

50819. "(No. 675. Nyanza, Urundi. February 27, 1920.) *Conge* with small head, central stem, but seed single in the flower."

50820. "(No. 676. Nyanza, Urundi. February 27, 1920.) Kafir; similar to No. 675 [S. P. I. No. 50819] may be the same."

50821. "(No. 732. Nyanza, Urundi. February 27, 1920.) A head of *Conge* or *Konge*, the red kafir, with double seed and good form."

50822. "(No. 733. Nyanza, Urundi. February 27, 1920.) A very small head of *m'tama*, the white kafir."

50823. "(No. 766. Nyanza, Urundi. March 9, 1920.) Several small heads of *m'tama*, white kafir, native grown."

50824. "(No. 767. Nyanza, Urundi. March 9, 1920.) A fine large head of *m'tama*, a white kafir. The seeds seem to be double; that is, two in each flower. This may be something new. I do not remember seeing anything just like it before."

50825. "(No. 768. Nyanza, Urundi. March 9, 1920.) Similar to No. 767 [S. P. I. No. 50824] but a more open, almost palmately branched, head. These numbers seem to be intermediate between the red and the white kafirs."

50826. "(No. 853. N'gano N'gano, Urundi, March 17, 1920.) *Conge*, red kafir, used largely to make pombe, or native beer."

50827. "(No. 865. N'gano N'gano, Urundi. March 18, 1920.) Red kafir (*Conge*) of type grown in the mountains."

50828. "(No. 916. Kigoma. March 27, 1920.) *M'tama*, white kafir, from native market."

50829. "(No. 935. Zanzibar. April, 1920.) White kafir."

50830. INDIGOFERA sp. Fabaceæ. **Indigo.**

"(No. 679. Nyanza, Urundi. February 28, 1910. Herb. No. 686.)"

50831. INDIGOFERA ENDECAPHYLLA Jacq. Fabaceæ. **Indigo.**

"(No. 909. Kigoma. March 26, 1920.)"

50832. IPOMOEA sp. Convolvulaceæ. **Morning-glory.**

"(No. 662. Nyanza, Urundi. February 26, 1920. Herb. No. 688.) A bush form, rather leafy; may be a good ornamental; flowers pale lavender and about 1 inch in diameter."

50833. IPOMOEA sp. Convolvulaceæ. **Morning-glory.**

"(No. 664. Nyanza, Urundi. February 26, 1920.) A fine flower; small vine with entire leaf."

50834. IPOMOEA PULCHELLA Roth. Convolvulaceæ. **Morning-glory.**

"(No. 764. Nyanza, Urundi. March 9, 1920.) A purple-flowered Ipomoea with a divided leaf; one of the most abundant types in central Africa."

50726 to 50966—Continued.

50835. JATROPHA CURCAS L. Euphorbiaceæ.

"(No. 830. Nyanza, Urundi. March 13, 1920. Herb. No. 708.) Black oil seed. Same as Nos. 459 and 611 [S. P. I. Nos. 50021 and 50239]. Planted as an ornamental."

50836. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. Tomato.

"(No. 867. N'gano N'gano, Urundi. March 18, 1920.) Small red tomato, grown by natives."

50837 and 50838. MANIHOT ESCULENTA Crantz. Euphorbiaceæ. (*M. utilissima* Pohl.) Cassava.

50837. "(No. 677. Nyanza, Urundi. February 28, 1920.) The sweet cassava; the roots were eaten fresh and are sweet and very good. Seed is not usually produced but is quite abundant here. This is the chief money crop as well as the staple food on the lowlands in and about Nyanza and Kigoma. The roots are sold either (1) when fresh, peeled, fermented, dried, and pounded into flour; or (2) as a thick pasty cake (which has no flavor except that derived from wood smoke) made by cooking the flour in water; or (3) prepared by boiling fresh roots and pounding them in a mortar. The leaves are eaten as a green vegetable and the roots eaten in the following ways: Fresh, merely having been peeled; baked or boiled; boiled and pounded to a paste; peeled, placed in earthen vessels with water and allowed to ferment for three days, then sun dried. These dried roots, which are often perfectly white but at times are covered with a black or blue mold, are either boiled in fat or pounded in a mortar and sifted to a white flour, which is boiled to form a starchy paste. This doughy mass, wrapped in banana-leaf containers, constitutes one of the principal foods of the natives. Containers holding from 15 to 20 kilograms of cassava flour each are sold at a rate of about 1.50 francs for 100 kilograms. Corn is abundantly grown but is not as universal as Manihot. Drought may harm the corn crop, but even in severe drought a Manihot plantation can be dug up and the roots eaten. The elevated beds on which the plants are cultivated insure the penetration of water into the soil. The old Manihot stems are broken up and placed in the ground at the top of broad ridges 3 feet or so across and 1 to 2 feet high. Its growth is rapid and the weeds and grasses are kept out by occasional hoeing. When about 4 years old the plants are dug up and a new crop started. The fully matured crop forms an open thicket 6 to 10 feet high. At Nyanza a leaf spot seemed to be the only disease, and this, although abundant, caused very little damage. I have not found any of the bitter cassava; all plants which I have tasted are sweet."

Plate III illustrates the native methods of preparing cassava roots for use.

50838. "(No. 904. Nyanza, Urundi. March 21, 1920.) Sweet cassava."

50839. MEIBOMIA sp. Fabaceæ. (*Desmodium* sp.)

"(No. 856. N'gano N'gano, Urundi. March 17, 1920.) A legume with sticky flower branches."

50726 to 50966—Continued.

50840 and 50841. NICOTIANA TABACUM L. Solanaceæ. **Tobacco.**

50840. "(No. 829. Nyanza, Urundi. March 13, 1920.) Tobacco, type grown by natives."

50841. "(No. 862. N'gano N'gano, Urundi. March 18, 1920.)"

50842. OCHNA LEPTOCLADA Oliver. Ochnaceæ.

"(No. 736. Nyanza, Urundi. March 7, 1920. Herb. No. 691.) An attractive low form about 1 to 2 feet high."

50843. PENNISETUM GLAUCUM (L.) R. Br. Poaceæ. **Pearl millet.** (*P. typhoideum* Rich.)

"(No. 920. Njahna, Tanganyika Territory. March 28, 1920.) Grown more abundantly here than at any place I have seen in Africa."

50844. PENNISETUM GLAUCUM (L.) R. Br. Poaceæ. **Pearl millet.** (*P. typhoideum* Rich.)

"(No. 932. Zanzibar. April 6, 1920.) Pennisetum from India."

50845 to 50901. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

"(Nyanza, Urundi. March 8, 1920.) Beans always are mixed in the field or market. They are marketed in large banana-leaf containers, which are either sack shaped or long and narrow. They are sold at 0.15 franc per kilo. It is one of the chief export crops."

50845. "(No. 781.) A short, thick, dark greenish brown or almost black bean; shows an indistinct dark stripe."

50846. "(No. 809.) Very dark tan, darker than No. 758 [S. P. I. No. 50886]; long, brown, flat bean."

50847. "(No. 811.) Dark chocolate with metallic sheen; short, thick bean."

50848. "(No. 694.) Light-brown, almost tan bean."

50849. "(No. 759.) Dark-brown, greenish, or deep-tan bean showing a stripe; yellow shows through at times; may be similar to No. 755 [S. P. I. No. 50857]."

50850. "(No. 788.) Tan-colored bean, more yellowish than No. 778 [S. P. I. No. 50852]."

50851. "(No. 789.) Darker than No. 788 [S. P. I. No. 50850]."

50852. "(No. 778.) Long, plump, dark-tan bean."

50853. "(No. 810.) Dark reddish or purple-tan bean, rather small."

50854. "(No. 757.) Rich deep tan-colored bean with mottled surface."

50855. "(Nos. 801, 804, and 806.) Wine-colored bean with dark stripe."

50856. "(No. 819.) Small, long, flat bean with light dots or stripes."

50857. "(Nos. 755, 782, and 800.) Yellow with brown markings, occasionally a brown stripe over a brown stripe. This is the favorite bean of the Watusi chiefs."

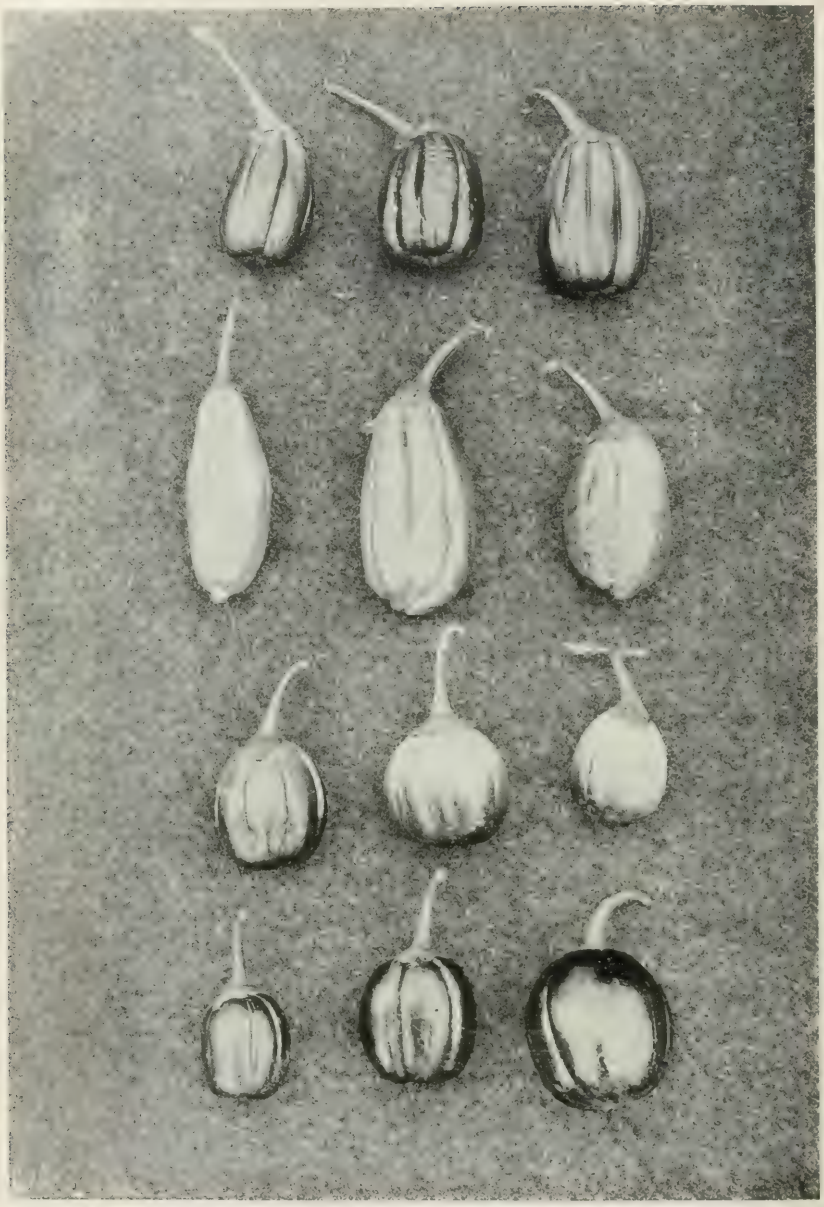
50858. "(Nos. 689, 759, and 799.) A gray mottled and striped bean similar to No. 690 [S. P. I. No. 50859]."

50859. "(No. 690.) Streaked and mottled yellowish bean; one of the most abundant, and prized by the natives."



PREPARING CASSAVA ROOTS IN TANGANYIKA TERRITORY. (MANIHOT ESCULENTA CRANTZ, S. P. I. No. 50837.)

Cassava is the staple food crop of many tribes in Africa, as it is along the Amazon. Doctor Shantz found that the variety introduced under S. P. I. No. 50837 serves many uses. The leaves are used as a green vegetable, and the roots are eaten in several ways—fresh, merely having been peeled; baked; or boiled and pounded into a paste, fermented in water for three days, then sun dried and made into a flour. The various methods are illustrated in this photograph. Since this plant grows luxuriantly in the Gulf States, its use as a table vegetable deserves much more consideration than it has hitherto received. (Photographed by Dr. H. L. Shantz, Nyanza, Urundi, February 27, 1920.)



TYPES OF EGGPLANTS FROM THE BELGIAN KONGO. (SOLANUM MELONGENA L., S. P. I. NOS. 50915 TO 50918.)

These types of eggplants are very popular with the natives. Those in the top row (S. P. I. No. 50915) are red on the stem end and yellow on the blossom end; those in the second row (S. P. I. No. 50916) are yellow; those in the third row (S. P. I. No. 50917) have the colors of the first set reversed; while those in the bottom row (S. P. I. No. 50918) are entirely red. All of them are shown about one-third natural size. (Photographed by Dr. H. L. Shantz, Nyanza, Urundi, March 10, 1920; P37766FS.)

50726 to 50966—Continued.

50860. "(No. 752.) Very small flat bean, light-chocolate with black stripe."

50861. "(No. 816.) A light bean with a greenish gray stripe."

50862. "(No. 817.) Light kidney-shaped bean with bluish stripe."

50863. "(No. 802.) Deep yellowish brown bean with black stripe."

50864. "(No. 805.) Long bean, light chocolate with vine-colored stripe."

50865. "(No. 634.) Red beans, probably several varieties, mostly mottled or streaked."

50866. "(Nos. 745, 649, and 688.) Red mottled, stripes or mottling of a deep red."

50867. "(No. 761.) Purple mottling over light chocolate, appears purple."

50868. "(No. 780.) Deep-red or carmine-colored bean."

50869. "(No. 821.) A short, deep-red bean similar to No. 780 [S. P. I. No. 50868] in color, but smaller and more nearly spherical."

50870. "(No. 822.) A short, thick, deep-red wine-colored bean."

50871. "(No. 818.) Purplish tan, long, flat bean."

50872. "(No. 786.) Long, flat, red bean, lighter in color than No. 780 [S. P. I. No. 50868]."

50873. "(No. 814.) A small, deep-purple mottled bean."

50874. "(No. 751.) Long, flat bean, deep red over a lighter pink, mottled or striped."

50875. "(Nos. 691 and 695.) A reddish mottled bean."

50876. "(No. 760.) Long, flat bean, lavender-purple mottled."

50877. "(No. 784.) Long bean, black mottled over a gray base."

50878. "(Nos. 750 and 798.) A long, somewhat flattened, mottled reddish lavender bean; abundant."

50879. "(No. 797.) Long, flat bean, similar to No. 750 [S. P. I. No. 50878], but mottled bluish."

50880. "(No. 820.) Purple bean with light dot or stripe, or mottled."

50881. "(Nos. 693 and 795.) Purple-gray mottled bean."

50882. "(No. 783.) A dark or gray or brownish mottled bean (on white)."

50883. "(No. 812.) Yellowish tan mottled, long, large, and flat bean."

50884. "(Nos. 692 and 756.) Brown mottled bean."

50885. "(No. 791.) Thick, short, purple chocolate-colored bean."

50886. "(No. 758.) A very dark tan bean, uniform surface."

50887. "(No. 785.) Drab or gray bean, uniform color, darker than No. 787 [S. P. I. No. 50888]."

50888. "(No. 787.) Light-gray, short, thick bean."

50726 to 50966—Continued.

50889. "(No. 685.) A very common curry-yellow bean; probably the most abundant type."

50890. "(No. 754.) Probably imperfect seed of No. 685 [S. P. I. No. 50889.]"

50891. "(No. 815.) A rather round, straw-colored bean."

50892. "(Nos. 747 and 683.) Large white bean, especially prized by the natives. One of the best types grown here; not as abundant as the other types."

50893. "(No. 790.) Like a navy bean, but larger."

50894. "(Nos. 746, 652, and 684.) Small, round or short, and white, like a navy bean."

50895. "(No. 633.) A rather long white bean."

50896. "(No. 748.) Small, black bean, said to give the best yield; thick and short, about the size of a navy bean."

50897. "(No. 687.) A large black bean."

50898. "(No. 792.) Black bean similar to No. 748 [S. P. I. No. 50896], but flat, and longer."

50899. "(No. 793.) A very small black bean."

50900. "(No. 779.) Long, flat, black or blue bean."

50901. "(No. 813.) Long, narrow bean, with white dots, deep bluish black or black mottled."

50902. PISUM SATIVUM L. Fabaceæ. **Garden pea.**

"(No. 855. N'gano N'gano, Urundi. March 17, 1920.) Field pea from the market. It grows well here in the cool mountain country."

50903. PSIDIUM GUAJAVA L. Myrtaceæ. **Guava.**

"(No. 618. Kigoma. February 20, 1920.) Seed of a guava, grown in this section, which is 2 inches in diameter, has yellow rind and reddish flesh."

50904 to 50906. RICINUS COMMUNIS L. Euphorbiaceæ. **Castor-bean.**

50904. "(No. 730. M'Sala. March 7, 1920.) Ricinus from native villages."

For previous introduction, see S. P. I. No. 49369.

50905. "(No. 859. N'gano N'gano, Urundi. March 17, 1920.) Ricinus wild in the hills."

50906. "(No. 922. Titici, Tanganyika Territory. March 29, 1920.) Seed of Ricinus."

50907. RUBUS sp. Rosaceæ. **Bramble.**

"(No. 860. N'gano N'gano, Urundi. March 18, 1920.) A red raspberry of fairly good flavor; a vinelike plant."

50726 to 50966—Continued.

50908. RUMEX MADERENSIS Lowe. Polygonaceæ.

"(No. 838. N'gano N'gano, Urundi. March 5, 1920.) Rumex called *saba saba;* the leaves are used as a green vegetable."

50909. SESAMUM ORIENTALE L. Pedaliaceæ. Sesame.

"(No. 637. Kigoma. February 21, 1920.) Sesamum; seed grown by the natives for oil production."

50910 to 50918. SOLANUM MELONGENA L. Solanaceæ. Eggplant.

50910. "(No. 614. Kigoma. February 20, 1920.) An eggplant about 2 inches in diameter, light-yellow color, ridges not pronounced. Probably this and the two following are much the same except for color. They are sold in the market, and seem to be a vegetable much used by the natives."

50911. "(No. 615. Kigoma. February 20, 1920.) Similar to No. 614 [S. P. I. No. 50910] but bright red in color. Looks much like the red tomato; similar to No. 496 [S. P. I. No. 50088] and No. 493 [S. P. I. No. 50087]."

50912. "(No. 616. Kigoma. February 20, 1920.) Similar to No. 614 [S. P. I. No. 50910] but of orange color; somewhat intermediate between No. 614 [S. P. I. No. 50910] and No. 615 [S. P. I. No. 50911]. If I mistake not, they are native eggplants."

50913. "(No. 625. Kigoma. February 20, 1920.) A green eggplant, light green with dark-green streaks, yellowish and a little reddish at the blossom end, longer than Nos. 614 [S. P. I. No. 50910], 615 [S. P. I. No. 50911], and 616 [S. P. I. 50912]."

50914. "(No. 640. Ujiji. February 22, 1920.) A long, slender eggplant, dark purple, and slightly curved, about 1½ to 2 inches in diameter and about 6 inches long. This form shows the decayed spots so common on our eggplant. Very similar to the types on our market."

50915. "(No. 772. Nyanza, Urundi. March 9, 1920.) Eggplant, yellow above and red below; popular type with the natives."

50916. "(No. 773. Nyanza, Urundi. March 9, 1920.) A long yellow eggplant, 3 inches long."

50917. "(No. 774. Nyanza, Urundi. March 9, 1920.) Short, yellow and red eggplant."

50918. "(No. 775. Nyanza, Urundi. March 9, 1920.) A very red eggplant that is almost spherical."

Of the varieties here listed Nos. 50915 to 50918 are illustrated in Plate IV.

50919. SOLANUM sp. Solanaceæ.

"(No. 862. N'gano N'gano, Urundi. March 18, 1920.) Large rough-fruited Solanum; used for medicinal purposes."

50726 to 50966—Continued.

50920. SPOROBOLUS sp. Poaceæ. Grass.

"(No. 728. M'Sala, Urundi. March 7, 1920.) A grass collected from sandy lake beach; probably same as No. 519 [S. P. I. No. 50037] and No. 845 [S. P. I. No. 50921]; if so, it is a valuable forage grass on the uplands and deserves a trial; it is perennial."

50921. SPOROBOLUS PYRAMIDALIS Beauv. Poaceæ. Grass.

"(No. 845. N'gano N'gano, Urundi. March 17, 1920.) One of the abundant grasses of the mountains."

50922. SYZYGIUM CUMINI (L.) Skeels. Myrtaceæ. Jambolan.
(*Eugenia jambolana* Lam.)

"(No. 949. Zanzibar, Zanzibar. April 6, 1920.) Eugenia called *jambolance;* looks about like a ripe olive; fairly good eating, and very abundant in the market."

For previous introduction, see S. P. I. No. 43217.

50923. TETRASTIGMA sp. Vitaceæ.

"(No. 663. M'Sala, Urundi. February 24, 1920.) A wild grape about the size and appearance of a small Concord; bunch very irregular."

50924. TRICHODESMA ZEYLANICUM (Burm. f.) R. Br. Boraginaceæ.

"(No. 680. Nyanza, Urundi. February 28, 1920. Herb. No. 687.) Borage; rather attractive plant and flowers."

50925 and 50926. TRICHOLAENA ROSEA Nees. Poaceæ. Natal grass.

50925. "(No. 703. Nyanza, Urundi. March 1, 1920.) A very abundant and important grass; may differ slightly from other samples of the same plant."

For previous introduction, see S. P. I. No. 49317.

50926. "(No. 850. N'gano N'gano, Urundi. March 17, 1920.) Abundant as a semiruderal."

50927. TRICHOPTERYX sp. Poaceæ. Grass.

"(No. 849. N'gano N'gano, Urundi. March 17, 1920. Herb. No. 738.) A slender oatlike grass with a habit like an annual; eaten by cattle even when other feed is abundant."

50928. TRICHOSANTHES sp. Cucurbitaceæ.

"(No. 705. Nyanza, Urundi. March 2, 1920.) A small white flower with darker markings, shaped like a small gladiolus; it is a low, ornamental vine."

50929. TRITICUM DURUM Desf. Poaceæ. Durum wheat.

"(No. 933. Zanzibar, Zanzibar. April 6, 1920.) Wheat from India."

50930 and 50931. VIGNA CYLINDRICA (Stickm.) Skeels. Fabaceæ Catjang.

50930. "(No. 642. Ujiji. February 22, 1920.) A Vigna with lanceolate leaflets; very abundant in the fields and apparently planted, but seed not seen in the market."

50931. "(No. 903. Nyanza, Urundi. March 21, 1920.) Bush cowpea."

For previous introduction, see S. P. I. No. 44765.

50726 to 50966—Continued.

50932 to 50942. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

50932. "(No. 632. Kigoma. February 21, 1920.) Cowpea grown everywhere by the natives."

For previous introduction, see S. P. I. No. 48793.

50933. "(No. 696a. Nyanza, Urundi. February 29, 1920.) Cowpea as marketed by the natives; many different types included. It is one of the important crop plants. The pods, with beans almost ripe but still soft, are boiled and eaten out of the pod."

50934. "(No. 707. Nyanza, Urundi. March 2, 1920.) Native-grown cowpea."

50935. "(No. 832. Nyanza, Urundi. March 13, 1920.) Purple-colored cowpea; not very numerous."

50936. "(No. 833. Nyanza, Urundi. March 13, 1920.) Chocolate-colored cowpea with purple tinge. Similar to No. 832 [S. P. I. No. 50935]."

50937. "(No. 834. Nyanza, Urundi. March 13, 1920.) Light chocolate or straw-colored cowpea with a purple streak below the eye."

50938. "(No. 835. Nyanza, Urundi. March 13, 1920.) A light chocolate-colored cowpea, no purple streak."

50939. "(No. 836. Nyanza, Urundi. March 13, 1920.) Uniform or reddish or purplish cowpea."

50940. "(No. 837. Nyanza, Urundi. March 13, 1920.) Mixed lot after Nos. 832 to 836 [S. P. I. Nos 50935 to 50939] had been separated."

50941. "(No. 902. Nyanza, Urundi. March 21, 1920.) Cowpeas from native field."

50942. "(No. 931. Dar es Salaam. April 1, 1920.) Dark cowpea from the east coast."

50943. VITIS sp. Vitaceæ. **Grape.**

"(No. 727. M'Sala, Urundi. March 7, 1920.) Wild grape seed. Flavor somewhat like a black currant and about the same size; the vine is low, almost shrublike."

50944 to 50946. VOANDZEIA SUBTERRANEA (L.) Thouars. Fabaceæ.

50944. "(No. 696. Nyanza, Urundi. February 29, 1920.) A groundnut grown by the natives. The ripe seeds are eaten occasionally when parched but they are very hard; they are yellowish in color. They are usually boiled while still green and eaten as one would potatoes."

50945. "(No. 831. Nyanza, Urundi. March 13, 1920.) Voandzeia with deep wine-colored beans. These are distinct from No. 696 [S. P. I. No. 50944], which are yellowish."

50946. "(No. 938. Zanzibar. April 6, 1920.) Voandzeia."

50726 to 50966—Continued.

50947 to 50956. ZEA MAYS L. Poaceæ. **Corn.**

50947. "(No. 629. Kigoma. February 21, 1920.) Corn grown locally by the natives; somewhat mixed type."

50948. "(No. 630. Kigoma. February 21, 1920.) Like No. 629 [S. P. I. No. 50947]. The ear is not so long as the flint ear; not mixed. Corn is here one of the chief crops. It is always grown in elevated beds, 1 to 1½ feet high. This type of cultivation is best for the long droughts which occur here."

50949. "(No. 378. Nyanza, Urundi. March 8, 1920.) Corn from native fields. It is planted in hills, is a tall corn, so tall that it is often difficult to reach the ears. The earts when almost ripe are roasted and eaten. When ripe, the stem is cut off below the ear or ears and stacked on an open bamboo fence, the ears all pointing down on one side. Occasionally it is hung in trees or in the top of the hut. It is next in importance to Manihot as a food crop and is also sold as a money crop."

50950. "(No. 739. Nyanza, Urundi. March 9, 1920.) A yellow flint with occasionally purple and dented light-colored kernels."

50951. "(No. 740. Nyanza, Urundi. March 9, 1920.) A white flint with purple cob and an occasional purple kernel."

50952. "(No. 741. Nyanza, Urundi. March 9, 1920.) Flint with a carmine flush, a purple cob, and an occasional purple kernel."

50953. "(No. 742. Nyanza, Urundi. March 9, 1920.) White flint with an occasional purple kernel."

50954. "(No. 743. Nyanza, Urundi. March 9, 1920.) Purple and white flint."

50955. "(No. 744. Nyanza, Urundi. March 9, 1920.) White flint, All the above corn is tall with a large stalk; grown by the natives."

50956. "(No. 852. N'gano N'gano, Urundi. March 17, 1920.) Corn: Yellow, white, red, and blue; grown by Chief Rusoka."

50957. (Undetermined.)

"(No. 737. Nyanza, Urundi. March 8, 1920.) A red-fruited Vitislike or Ampelopsislike vine."

50958. (Undetermined.)

"(No. 858. N'gano N'gano. March 17, 1920.) A small legume with a habit similar to our *Psoralea tenuiflora*."

50959. (Undetermined.)

"(No. 905. Nyanza, Urundi. March 21, 1920.) A dark fruit like a chokecherry; probably not edible."

50960. (Undetermined.)

"(No. 928. Dar es Salaam. April 1, 1920.) *Mopia*. Like a Strychnos."

50961. PENNISETUM GLAUCUM (L.) R. Br. Poaceæ. **Pearl millet.** (*P. typhoideum* Rich.)

"(No. 936. Zanzibar, Zanzibar. April 6, 1920.) Pennisetum from east coast of Africa."

50726 to 50966—Continued.

50962 to 50964. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean.**

50962. "(No. 702. Nyanza, Urundi. March 2, 1920.) Small green bean."

50963. "(No. 919. Tabora. March 2, 1920.) Small green bush bean. Plants covered with flies."

50964. "(No. 937. Zanzibar, Zanzibar. April 6, 1920.) Small green bean."

50965 and 50966. PHASEOLUS VULGARIS L. Fabaceæ. Common bean.

50965. "(No. 803. Nyanza, Urundi. March 8, 1920.) Long, narrow, mottled purplish bean with greenish stripe."

50966. "(No. 807. Nyanza, Urundi. March 8, 1920.) Similar to No. 757 [S. P. I. No. 50854], but a deeper reddish tan."

50967. CITRUS sp. Rutaceæ.

From Swatow, Kwantung, China. Seeds presented by A. H. Page. Received June 1, 1920.

"Fruits we call the Chinese lime. The one that is nearly ripe weighs now about 4½ ounces, the green one 2 ounces. Either would make a fairly good lemon pie, the riper one having the better flavor. The tree is very hardy and bears immense crops. I picked nearly 600 last fall from a tree about 9 feet high and of moderate spread. I certainly believe it is worth a trial for lime juice and citric acid." (*Page.*)

50968. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

From Miami, Fla. Originated at the Miami Plant Introduction Garden. Numbered July 31, 1920.

Variety *Dade.* This variety, which originated as a seedling from the Trapp avocado, ripens its fruit in November. The fruit is globose, green skinned, and of excellent quality. The tree grows vigorously and yields prolifically and regularly.

50969. PORTULACARIA AFRA Jacq. Portulacaceæ. **Spekboom.**

From San Diego, Calif. Cuttings presented by Miss Kate Sessions. Received at the Plant Introduction Garden, Chico, Calif., July 12, 1920. Numbered July, 1920.

A South African shrub or small tree with succulent shoots which are said to be keenly relished by live stock. The plant is reported to grow on dry waste places without requiring attention.

For a fuller description of this plant, see S. P. I. No. 48510, and also Nos. 9604 and 12020.

50970 and 50971.

From Monrovia, Liberia. Seeds presented by O. W. Barrett. Received July 1, 1920. Quoted notes by Mr. Barrett.

50970. CARICA PAPAYA L. Papayaceæ. **Papaya.**

"A very fine red-fleshed papaya."

50971. SOLANUM MELONGENA L. Solanaceæ. **Eggplant.**

"A shrubby, thorny, native eggplant, one of four rather important and interesting quasi-native Solanums used by the inhabitants here."

50972 to 50997. OLEA EUROPAEA L. Oleaceæ. **Olive.**

From Adelaide, South Australia. Cuttings presented by J. F. Bailey, director, Botanic Garden. Received July 14, 1920. The descriptions following, except as otherwise stated, are adapted from Lelong, California Olive Industry, pp. 53–55, and from Ruby, Recherches Sur l'Olivier en France, pp. 97–279.

50972. *Atroviolacea Brun Bibier.*

50973. *Black Italian.*

50974. *Bouquetier.* A stout-branched tree with large thick leaves; fruits often clustered, large or small, bulging on one side; skin black and shining when ripe; flesh scanty, violet, very rich in oil. (*Ruby.*)

50975. *Bouteillon.*

50976. *Corregiolo.* A vigorous grower and prolific bearer, doing best on rich soils. The fruit, which ripens in November, yields a high-grade oil. (*Lelong.*)

50977. *Cushine.*

50978. *Frantoju.* "A synonym of *Corregiolo.*" (*A. T. Marvin.*)

50979. *Grossee Redowno.* "Produces large fruit, yielding very high returns of oil of the best quality." (*Agricultural Gazette of New South Wales, July 2, 1919.*)

50980. *Hardy's Mammoth.* "A local seedling with a large berry, yielding 27.4 per cent of oil." (*Journal of the Department of Agriculture of South Australia, vol. 5, p. 928.*)

50981. *Institute.*

50982. *Large Fruiting.*

50983. *Late Blanquette.*

50984. *Longue d'Ascoli.*

50985. *Lucca.*

50986. *Morchioso.* Concerning the quality and yield of oil, the Journal of the Department of Agriculture of South Australia, vol. 20, p. 549, gives the following: Moisture, 42.36 per cent; oil (fresh olives), 27.29 per cent; yield per ton of fruit, 66.73 gallons.

50987. *Morocco.*

50988. *Palermo.* Concerning the quality and yield of oil, the Journal of the Department of Agriculture of South Australia, vol. 20, p. 549, gives the following: Moisture, 36.69 per cent; oil (fresh olives), 25.58 per cent; yield per ton of fruit, 61.83 gallons.

50989. *Picholin.* The tree is large and a strong grower. The oblong fruits, which ripen early, are pickled green. (*Lelong.*)

50990. *Pueblano.*

50991. *Royal de Languedoc.*

50992. *Rubra Caillon de Aix.*

50993. *Saint Catherine.* A medium-sized tree producing extra large fruits good for pickling green. (*Lelong.*)

50994. *Salome.*

50995. *Sir George Gray's Spanish.*

50996. *Verdale.* An early-ripening tree of dwarf habit; a shy bearer, sensitive to cold. Fruits suitable for pickling. (*Lelong.*)

50997. *White.*

50998 and 50999.

From Kulare, via Cairns, northern Queensland, Australia. Seeds presented by J. A. Hamilton. Received July 20, 1920. Quoted notes by Mr. Hamilton.

50998. ELEUSINE CORACANA (L.) Gaertn. Poaceæ. **Ragi millet.**

"A very productive cereal from India. Grows well where wheat is not a success."

For previous introduction, see S. P. I. No. 46295.

50999. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

"Improved Dwarf Lima. A new variety of Lima bean, my Improved Dwarf being a natural cross between Burpee's Bush Lima and the Dwarf Lima. In this climate the heavy pods of Burpee's Bush Lima beans have the tendency to lie on the ground and so rot in our wet spells, but my Improved Dwarf holds its stems upright and so keeps sound; it is also very prolific."

51000 to 51002.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky, Jardin d'Acclimatation. Received July 20, 1920. Quoted notes by Dr. Proschowsky.

51000. ALECTRYON SUBCINEREUM (A. Gray) Radlk. Sapindaceæ.
(*Nephelium leiocarpum* F. Muell.)

"A small tree with beautiful evergreen foliage; it is very hardy here, so that it might eventually serve as stock on which to graft fruit trees like *Nephelium longanum*, *N. mutabile*, and especially *Litchi chinensis*."

51001. FUCHSIA SPECIOSA Hort. Onagraceæ. **Fuchsia.**

"A few ripe fruits (edible, as are those of several species of Fuchsia) of *Fuchsia speciosa*. Still it is not as a fruit plant that I recommend it, but mainly as a strikingly beautiful flowering evergreen bush, with its gracefully drooping branchlets covered with hundreds of red flowers. It is quite hardy here."

51002. PASSIFLORA sp. Passifloraceæ.

"A very beautiful evergreen climber, with rose-colored flowers and edible fruits. It is quite hardy here."

Received as *Tacsonia jamesoni*, which does not seem to have been transferred to Passiflora.

51003 and 51004.

From Guayaquil, Ecuador. Seeds presented by James Birch Rorer, Asociación de Agricultores del Ecuador. Received July 20, 1920. Quoted notes by Mr. Rorer.

51003. ANNONA CHERIMOLA Mill. Annonaceæ. **Cherimoya.**

"(No. 44.) Seeds of a cherimoya; a large fruit containing only a small number of very large seeds."

51004. CYCLANTHERA PEDATA (L.) Schrad. Cucurbitaceæ.

"(No. 43.) A cucurbitaceous vegetable grown here, commonly called achoccha or achogcha."

An annual climber, native to western South America and Central America, where it is often cultivated for its edible fruits and shoots.

51003 and 51004—Continued.

It has 5-lobed leaves and inconspicuous flowers; the fruit, a pepo, is about 5 inches long, narrowly oval with a smooth skin or a few soft basal spines. (Adapted from *Contributions from the U. S. National Herbarium, vol. 13, p. 120.*)

For previous introduction, see S. P. I. No. 29330.

51005 and 51006.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received July 20, 1920.

51005. CARISSA CARANDAS L. Apocynaceæ. **Karanda.**

A small bush, not much higher than a man, with dense, dark-green, shining foliage and sharp stipular thorns an inch in length. The coriaceous, oval, or emarginate leaves are about an inch long and broad. The flowers are small, white, and jasminelike. They come out in the hot weather, but the charm of the bush is in July when its half-ripe waxy berries hang in clusters all over the bush. They are the size of olives, a brilliant red on one side and cream on the other. When ripe they are a uniform dark-red with a bland milky juice; the fruit is sour, and is much used by the natives for making chutney [a sort of spicy pickle]. The little unripe berries, with the skin and seeds removed, cooked in pastry with sugar and cloves, make a fair substitute for apple tarts. (Adapted from *Gardener's Chronicle, vol. 24, p. 262.*)

For previous introduction, see S. P. I. No. 46636.

51006. MICROCOS LATEBIFLORA L. Tiliaceæ.
(*Grewia asiatica* L.)

A small hazellike tree, native to the East Indies and cultivated throughout India. The small dark-purple berry is a pleasantly acid fruit and is much esteemed by the natives. A sherbet and wine are prepared from it in many parts of the country. From the bark a fiber is extracted which resembles European bast fiber and is much used in rope making. The mucilaginous juice of the bark is used in Seharunpur for clarifying sugar. The yellowish white, close-grained wood is strong and elastic and much prized for making banghy poles and for other purposes for which combined lightness and strength are desired. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 4, p. 177.*)

For previous introduction, see S. P. I. No. 43659.

51007. CYATHEA sp. Cyatheaceæ. Tree fern.

From Lamao, Bataan, Philippine Islands. Spores presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received July 21, 1920.

"A tree fern with spiny midribs, collected in Baguio at an altitude of about 5,000 feet. The plant is exceedingly attractive and would unquestionably make a good conservatory plant." (*Wester.*)

51008 and 51009.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received July 26, 1920.

51008 and 51009—Continued.

51008. CESTRUM sp. Solanaceæ.

"A very handsome Cestrum with yellow flowers, from Baguio, at an altitude of about 5,000 feet, which should be a valuable acquisition to the ornamental flora of Florida." (*Wester.*)

51009. PANDANUS TECTORIUS Parkins. Pandanaceæ.

A shrubby plant, up to 20 feet high, rarely erect; the stem is supported by aerial roots. The glaucous green leaves are coriaceous, sword shaped, and 3 to 5 feet long, with the marginal spines pointing forward, those on the midrib, forward or backward. The spadix of numerous cylindrical spikes of male flowers is 2 to 4 inches long and 1 to 1½ inches wide, and is inclosed in a long, white, fragrant spathe. A perfume which is much esteemed in Java is obtained from the male flowers. The solitary spadix of female flowers is followed by a yellow or red fruit which is an oblong or globose syncarpium, 6 to 10 inches long and broad. The plant is native of Konkan, Bombay, in sandy places near the seacoast. It is often planted and is known as the screw pine. (Adapted from *Cooke, The Flora of Bombay, vol. 2, p. 814.*)

For previous introduction, see S. P. I. No. 44779.

51010. GOSSYPIUM sp. Malvaceæ. **Cotton.**

From Algiers, Algeria. Seed presented by Dr. L. Trabut, director, Service Botanique. Received July 28, 1920.

"An herbaceous cotton from the Oasis of El Golea." (*Trabut.*)

51011. MICROCITRUS AUSTRALASICA (F. Muell.) Swingle. Rutaceæ. (*Citrus australasica* F. Muell.) **Finger lime.**

From Wellington Point, Queensland, Australia. Seed presented by James Pink. Received July 29, 1920.

One of the most curious and interesting of the citrus fruits, native to the mountainous scrubs of the coastal region of northern New South Wales and Queensland. The young plants have more or less horizontally arranged branchlets, with very short internodes, small oval leaves, and stiff erect spines. The long, slender, cylindric-fusiform fruits, 6.5 to 10 centimeters long and 1.5 to 2.5 centimeters broad, are often slightly curved and frequently show a short blunt protuberance at both base and tip. The juice is sour and rather strongly pungent. The young plants of the finger lime showing the juvenile foliage arranged in tiers somewhat like a young araucaria plant, are very ornamental and should become better known for decorative purposes. It is a promising hedge plant, because it is very spiny and can be grown from cuttings. It is decidedly more hardy than the lime or lemon and may prove useful in breeding new types of hardy citrus fruits. (Adapted from *Journal of the Washington Academy of Sciences, vol. 5, p. 572.*)

For previous introduction, see S. P. I. No. 31877.

51012. ARTOCARPUS INTEGRA (Thunb.) L. Moraceæ. **Jack fruit.** (*A. integrifolia* L.)

From Mayaguez, Porto Rico. Seeds presented by T. B. McClelland, horticulturist, Porto Rico Agricultural Experiment Station. Received July 2, 1920.

A very large tree native to southern India and the Malay Peninsula and Archipelago. It is valued chiefly for its enormous fruits, a single one of which

may weigh over 100 pounds. These fruits, which are borne on the trunk and older branches, are usually irregularly oblong and are always green, with the rind consisting of somewhat hexagonal knobs. When ripe the fruits have a powerful odor, and the stronger the latter the better the quality of the fruit. With the exception of the rind and core, the entire fruit is eaten, the white or cream-colored, soft, flaky pulp being used either raw, or boiled and fried. The large seeds are roasted and used in curries.

The timber of this tree is excellent for cabinetwork: it is lemon yellow at first, turning darker with age. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting, p. 127.*)

For previous introduction, see S. P. I. No. 40825.

51013 to 51015.

From Guayaquil, Ecuador. Seeds presented by James Birch Rorer, Asociación de Agricultores del Ecuador. Received July 3, 1920. Quoted notes by Mr. Rorer.

51013. ANNONA CHERIMOLA Mill. Annonaceæ. **Cherimoya.**

"(No. 32.) *Cherimoya de la Sierra* is listed by Martinez in his Flora of the Province of Tunguragua as *Annona cherimola*, and he also states that this fruit is believed to be a native of the Province of Loja. It grows well at 5,000 to 7,000 feet altitude and ought to do well in Florida. The fruit is quite smooth on the outside, but is white within and has a flavor similar to the tropical sugar-apples."

For previous introduction, see S. P. I. No. 47318.

51014. ANNONA RETICULATA L. Annonaceæ. **Custard-apple.**

"(No. 33.) Cherimoya; a large and very rough-skinned form."

For previous introduction, see S. P. I. No. 49289.

51015. ANNONA SQUAMOSA L. Annonaceæ. **Sugar-apple.**

"(No. 34.) Cherimoya; this form has a somewhat smooth skin."

For previous introduction, see S. P. I. No. 49290.

51016 to 51021. ELAEIS GUINEENSIS Jacq. Phœnicaceæ. Oil palm.

From Buitenzorg, Java. Seeds presented by the director, Plant-Breeding Station. Received July 3, 1920.

The following varieties are selected forms of different origin.

For general description, see S. P. I. No. 47124.

51016. (No. 6.) Variety *Nsombe B.* From Belgian Kongo.

For previous introduction, see S. P. I. No. 47307.

51017. (No. 8.) Variety *Nsombe C.* From Belgian Kongo.

For previous introduction, see S. P. I. No. 47305.

51018. (No. 11.) Variety *Singapore A.* From Singapore.

51019. (No. 13.) Variety *Banga.* From Kamerun.

For previous introduction, see S. P. I. No. 47504.

51020. (No. 23.) Variety *Lissombe.* From Kamerun.

51021. (No. 30.) Variety *Bundi* C. From Belgian Kongo.

For previous introduction, see S. P. I. No. 47306.

51022 and 51023.

From Buitenzorg, Java. Seeds presented by the director, Plant-Breeding Station. Received July 3, 1920.

The following seeds were received without description, accompanied only by the native names. Descriptions will not be available until the seeds have been grown.

51022. CUCURBITA PEPO L. Cucurbitaceæ. Gourd.

Laboe Batik Lohdor.

51023. LAGENARIA VULGARIS Seringe. Cucurbitaceæ. Gourd.

Laboe aer.

51024 and 51025.

From Bogota, Colombia. Seeds purchased from M. T. Dawe. Received July 7, 1920. Quoted notes by Mr. Dawe.

51024. ATTALEA sp. Phœnicaceæ. Palm.

"Nuts of the *Mamarrón palm*, from the Magdalena Valley, on the alluvial lands. An important source of vegetable oil in this country."

51025. (Undetermined.)

"Nuts of the *Palma de San Juan*, from the upper parts of the foothills of the Magdalena Valley region. May produce oil of value."

51026. DENDROCALAMUS GIGANTEUS Munro. Poaceæ. Bamboo.

From Peradeniya, Ceylon. Seeds presented by H. F. Macmillan, superintendent, Royal Botanic Gardens. Received July 7, 1920.

The tallest of the bamboos, a native of the Malay Peninsula but much cultivated in Burma, where it is known as *wabo* and in Assam as *worra*. It is used in Burma for posts and rafters in house building, for carts, and for joints for pails, boxes, flowerpots, etc. The large culms are often 120 feet long and 25 to 30 inches in circumference. Extra fine culms are cut into short lengths and prepared as umbrella stands.

The rapid growth of this strikingly handsome bamboo was tested in the botanic garden at Buitenzorg, Java, where the plant grew, on the average, 7.7 millimeters per hour by day and 13 millimeters per hour by night. One culm grew 57 centimeters in 24 hours. (Adapted from *Watt, Commercial Products of India, p. 101*, and *Schimper, Plant Geography, p. 216.*)

For previous introduction, see S. P. I. No. 45963.

51027 to 51033.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received July 7, 1920. Quoted notes by Mr. Popenoe.

51027. DOLICHOLUS PHASEOLOIDES (Swartz) Kuntze. Fabaceæ.
(*Rynchosia phaseoloides* DC.)

"(No. 397a. June 18, 1920.) Seeds of a slender climber from the mountains near San Pablo Tarrazu, elevation about 5,500 feet. Its trifoliolate leaves, which are borne upon slender wiry stems, suggest those of the common bean (*Phaseolus vulgaris*), and its seeds are strikingly similar to those of *Abrus precatorius*, the crab's-eye of the West Indies; they are small, and bright red with a black eye. Of interest chiefly for its seeds."

51027 to 51033—Continued.

51028. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"(No. 398a. June 18, 1920.) Cotton seed from a plant growing in the park at Alajuela, Costa Rica. The variety is one with brown fiber, of unknown origin."

51029 to 51031. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

51029. "(No. 400. June 18, 1920.) Bud sticks of avocado No. 45, from the property of Padre Zuñiga, in Alajuela, Costa Rica. This tree was called to my attention by Don Anastasio Alfaro, who has been familiar with it for years. He states that it is one of the best avocados in Alajuela, if not the best of all. I have seen very little of the variety. The parent tree is old, and not in good condition. It stands in an inclosed property behind the principal church of Alajuela. The fruit is slender pyriform in outline, green when ripe, and probably 12 to 16 ounces in weight. The quality is said to be very good, but I suspect the seed may be too large, by our standards. The variety is evidently of the West Indian race, and ripens its crop in July and August."

51030. "(No. 383 and No. 402. May 27 and June 18, 1920.) Bud sticks of avocado No. 43, from the garden of Pantaleon Cordoba, San Jose. This variety has something of a local reputation as an avocado of excellent quality, and in addition ripens later than the average. In some of its characters it looks much like a Guatemalan; but more likely it is simply a highland form of the West Indian race (there is, of course, no hard and fast line which separates the two races, anyway). The parent tree, which stands about 50 feet to the rear of Sr. Cordoba's house, is 25 or 30 feet high, with a scanty crown and a straight trunk nearly 2 feet thick at the base. The fruit at this time (June, 1920) is not half grown, but I have seen a model of the mature fruit, made by Don Anastasio Alfaro, Director of the National Museum. The form is nearly spherical, with a tendency to longitudinal ribbing; the weight is perhaps 18 ounces and the color deep green. I believe the seed is proportionately smaller than in most of the Costa Rican avocados, and the quality of the flesh is said to be excellent. The ripening season is September to November."

51031. "(No. 392a. June 18, 1920.) Seeds of *aguacate de anis*, the wild avocado, from the region of La Palma."

"The character of the tree and fruit is such as to suggest that this species, which is certainly indigenous in the mountains of central Costa Rica, is the wild prototype of the cultivated Guatemalan race, if not of the West Indian as well. The wild tree has been observed up to the present only at altitudes between 4,500 and 5,000 feet. It is not found in the forest, but frequents open places close to small streams and brooks, or is found associated with a few other trees along the margins of such watercourses.

"In general appearance the trees can scarcely be distinguished from Guatemalan avocados; the foliage is of a somewhat lighter shade of green than is common in the latter. The flowering season is March and April, and the fruits ripen a year from the following May or June—that is, in from 12 to 15 months. The



A WILD AVOCADO TREE IN COSTA RICA. (PERSEA SP., PROBABLY P. AMERICANA MILL., S. P. I. No. 51031.)

This wild avocado, which, up to the present, has been observed only on the slopes of the volcano Irazu, in central Costa Rica, is believed by its discoverers, Wilson Popenoe and Oton Jimenez, to be the wild prototype of the cultivated Guatemalan race of avocados, and probably of the West Indian as well. It is quite distinct from the Mexican avocado both in appearance of tree and foliage and in the character of the fruit. Because of its wild nature and the vigor of its growth it is believed this avocado may be of value as a stock plant on which to graft cultivated sorts. (Photographed by Wilson Popenoe, near La Palma, Costa Rica, June 9, 1920; P17902FS.)



THE AGUACATE DE ANÍS, OR WILD AVOCADO, OF COSTA RICA. (PERSEA SP., PROBABLY P. AMERICANA MILL., S. P. I. NO. 51031.)

In general character the wild avocado of Costa Rica closely resembles some of the cultivated sorts of the Guatemalan race. It has a thick, woody, coarsely granular shell, dark green on the surface. The flesh is yellow and unlike that of cultivated avocados in that it is strongly anise flavored and contains small gritty bodies like the stone cells in some of the Chinese pears. The seed is large and tight in the cavity. The average weight of specimens collected in Costa Rica was about 6 ounces. (Photographed by Wilson Popenoe, San Jose, Costa Rica, May 31, 1920; P17845FS.)

51027 to 51033—Continued.

fruits from some of the wild trees are harvested by the natives and carried into the villages, where they are sold.

"This species will be studied further to determine its relationship with the cultivated avocados. It is introduced with this object in view and in the hope that it may prove to be a vigorous stock plant on which to graft some of the cultivated avocados."

For further description, see S. P. I. No. 50585.

For illustrations of the tree and of a fruit of the wild avocado, see Plates V and VI.

51032. PERSEA CAERULEA (Ruiz and Par.) Mez. Lauraceæ.

"(No. 399a. June 18, 1920.) From the mountains near Frailes, Costa Rica. Altitude, about 5,500 feet. Seeds of a common tree in this region, found usually in half-open places of the mountainsides and not in the dense forest. It reaches about 30 feet in height, and has a leaf strongly resembling that of *Persea americana* but more narrow than in many varieties of the latter. The fruits, which are produced abundantly in racemes, are black, the size of large peas, with very little pulp surrounding the seed. Introduced for trial as a stock plant for the avocado."

51033. RUBUS COSTARICANUS Liebm. Rosaceæ. **Blackberry.**

"(No. 401a. June 18, 1920.) Seeds of a wild blackberry, *mora*, from Frailes, Costa Rica. Altitude, about 5,500 feet. The plant is a vigorous, bushy grower, and the fruits, which are produced in reasonable profusion, are composed of few large drupelets, making them somewhat different in appearance from the common blackberries of the North. They are of good flavor, but not very large—rarely more than three-quarters of an inch long but nearly as broad as long. Of interest to those engaged in blackberry breeding."

51034 to 51036.

From Buitenzorg, Java. Seeds presented by the director, Plant-Breeding Station. Received July 7, 1920.

51034 and 51035. CUCURBITA PEPO L. Cucurbitaceæ. **Gourd.**

The following varieties were received without description.

51034. *Laboe deppe.*

51035. *Laboe Batik hawaek.*

51036. PLACUS BALSAMIFER (L.) Bail. Asteraceæ.
(*Blumea balsamifera* DC.)

A rather bushy woolly plant with a tall branched stem and leathery leaves 4 to 8 inches long. The flowers, borne in numerous small heads, have red pappus. The whole plant smells strongly of camphor which may, indeed, be prepared from it, and a warm infusion of the leaves acts as a pleasant sudorific. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 458.*)

51036. PLACUS BALSAMIFIER (L.) Bail. Asteraceæ.

From Kashmir, India. Seeds presented by Charles Hadow, British Embassy, Washington, D. C. Received July 7, 1920.

"The 'Tunla' or 'Galmey sunflower,' collected at an altitude of 8,000 feet in Kashmir, India, on grassy slopes exposed to snow in winter." (*Hadow.*)

A very attractive sunflowerlike composite from the western Himalayas. The very stout stem is usually not more than a foot high, occasionally 18 inches, with yellowish green, thick-veined, finally serrate leaves and very broad thick bracts. The flowers are usually solitary and a brilliant orange in color, with crenate ray flowers. (Adapted from *Flora and Sylva, vol. 1. p. 310.*)

51038 to 51040. PSIDIUM GUAJAVA L. Myrtaceæ. **Guava.**

From Porto Alegre, Rio Grande do Sul, Brazil. Seeds presented by G. S. Froes. Received July 7 ,1920. Quoted notes by Mr. Froes.

Three varieties.

51038. "Yellow fruited; used as sweet preserves."

51039. "Rose-colored fruit; used for guava jelly."

51040. "White fruited; eaten fresh."

For previous introduction, see S. P. I. No. 48575.

51041. NONNEA ROSEA Link. Boraginaceæ.
(*Anchusa rosea* Bieb.)

From Stockholm, Sweden. Seeds presented by Dr. Robert E. Fries, director, Botanic Garden. Received July 10, 1920.

An attractive hardy annual from the northern Caucasus. It has procumbent stems, oblong leaves, and funnel-shaped, purple-white flowers. (Adapted from *Bieberstein, Flora Taurico-Caucasica, vol. 1, p. 125.*)

51042 to 51046. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**

From Nanking, Kiangsu, China. Seeds presented by John K. Davis, American consul. Received July 12, 1920.

"Five varieties; obtained from a grain market in the city of Nanking." (*Davis.*)

51042. *Black.*

51043. *Tsing.*

51044. *Fifth month yellow.*

51045. *Late yellow.*

51046. *Yellow eighth month.*

51047 to 51049.

From Auckland, New Zealand. Seed presented by J. W. Poynton. Received July 15, 1920. Quoted notes by Mr. Poynton.

51047. ENTELEA ARBORESCENS R. Br. Tiliaceæ.

"A beautiful tree with extremely light wood, half as heavy as cork. Its large, maplelike leaves are evergreen. It is the only representative of its genus. Its distribution is confined to two small areas in the North Island of New Zealand and one in the South Island. Will grow only in warm climates, but should do well in California and your Southern States."

For previous introduction, see S. P. I. No. 48165.

51048. METROSIDEROS TOMENTOSA A. Rich. Myrtaceæ.

"This tree, called *pohutukawa* by the Maoris, loves the seashore and will grow where at high tides the sea water covers its roots. It will also grow inland, many fine specimens being found around Lake Taupo

51047 to 51049—Continued.

in the heart of the North Island. The timber is hard and durable and especially useful for boat building, as its limbs have many knees. About Christmas time (midsummer here) it is covered with a wealth of scarlet blossoms, and on this account the British colonists call it the Christmas tree. As it has thick evergreen foliage and is quite uninjured by salt-water spray, it makes splendid shelter in exposed seaside situations. It grows readily from slips; and a hedge, shelter belt, or plantation is quickly available. It will not grow in a cold climate, but should find a congenial second home in Florida, California, and the Gulf States, where it should be of considerable value. I gathered this seed from a well-shaped healthy specimen, which last summer was a picture with its abundant blossoms."

For previous introduction, see S. P. I. No. 48151.

51049. MERYTA SINCLAIRII (Hook. f.) Seem. Araliaceæ.

"*Puka.* This small diœcious tree grows from 15 to 20 feet high and has larger leaves than any other New Zealand plant. It is found native only in the North Island; once the rarest of trees, only one specimen being known. A missionary discovered it near a native village (pah). It was 'tapu,' and he was forbidden under pain of death to touch it. He sketched it and announced its discovery, which was skeptically received among botanists. He returned in 12 years and found the pah deserted. He obtained some of the leaves, and the plant was classified by the botanist, Sinclair, and named for him. Subsequently 27 plants were discovered on some small islands in the Hauraki Gulf (New Zealand). From them, all existing trees of this species originated. It is a very ornamental tree, much favored for parks and gardens. It will not stand much frost, but should grow well in your warmer areas. It makes a beautiful pot plant. Like nearly all our trees, it is evergreen. Trees vary much in the size and glossiness of their foliage. The tree from which I collected the inclosed seed is a very fine one."

For previous introduction, see S. P. I. No. 47570.

51050 and 51051.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the Bureau of Plant Industry. Received July 15, 1920. Quoted notes by Mr. Popenoe.

51050. ANNONA MURICATA L. Annonaceæ. **Soursop.**

"(No. 407. June 24, 1920.) Bud sticks of the *Bennett* soursop. A choice variety of the soursop from the garden of the superintendent of Zent Farm, United Fruit Co., near Port Limon. The tree is more productive than any other I have seen, and the fruit is unusually large and handsome. Budded trees of this variety should be tested in Porto Rico, Cuba, southern Florida, and elsewhere; I believe they will prove decidedly superior to the average seedling. The name *Bennett* has been given in honor of Mr. George S. Bennett, agricultural superintendent of the Costa Rican division, United Fruit Company."

For previous introduction, see S. P. I. No. 49258.

For an illustration of the fruit of the soursop, see Plate VII.

51050 and 51051—Continued.

51051. GUILIELMA UTILIS Oerst. Phœnicaceæ. **Palm.**
(*Bactris utilis* Benth. and Hook.)

"(No. 411a. June 24, 1920.) Seeds of the *pejibaye* palm, from fruits obtained in Tucurrique."

For description, see No. 391a [S. P. I. No. 50679].

51052 to 51055.

From Chama, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received July 9, 1920. Quoted notes by Mr. Johnson.

51052. ARDISIA sp. Myrsinaceæ.

"(No. 228.) Seeds of a red-berried shrub collected at Xalave, at an altitude of about 1,500 feet. The berries are produced quite freely in flat-topped clusters, 2 to 3½ inches in diameter, along the larger stems on short branchlets as well as terminally; the bright, shining red berries are one-fourth to half an inch in diameter and, with the foliage, make the shrub quite ornamental. I have not noticed the birds molesting the fruits, and the bunches always appear well filled. The berries evidently last in perfection a long time, as I have observed them for two months or more and they are still perfectly fresh and clean. The shrub may be of value as a red-berried pot plant for florists and for outside planting in Florida and California."

51053. ARDISIA sp. Myrsinaceæ.

"(No. 231.) Seeds of a color variety of No. 228 [S. P. I. No. 51052]. Fruits are rich wine purple. Quite pretty."

51054. CAPSICUM ANNUUM L. Solanaceæ. **Red pepper.**

"(No. 226.) 'Rash-ik' (green Chile pepper), also 'Sal-ik' (white Chile pepper). A fine-flavored Chile pepper that is always in demand here and commands the best price. When immature it is creamy white, though some specimens are tinged with purple. When fully ripe it is a rich red and is very hot. For three days after cleaning this seed my hands burned. When not mature it is not very hot and may be eaten with impunity. The bush does not reach a very large size (3 feet) and bears when 1 foot in height."

51055. PASSIFLORA LIGULARIS Juss. Passifloraceæ. **Sweet granadilla.**

"(No. 227.) Seeds from wild vines. The pulp is very pleasant, but the juice in the aril is very acid and almost takes the skin off one's mouth. This material was brought to me by an Indian."

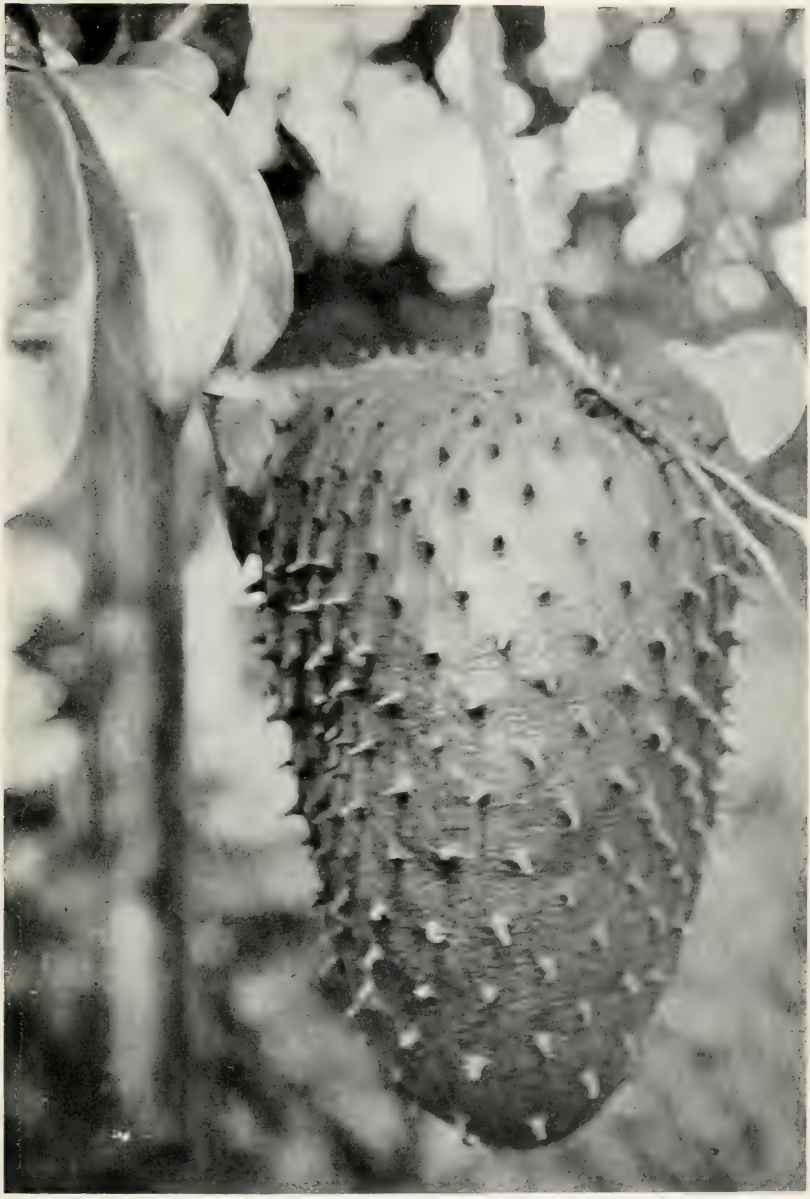
51056. CHAYOTA EDULIS Jacq. Cucurbitaceæ. **Chayote.**
(*Sechium edule* Swartz.)

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received July 31, 1920.

"Fruits of *guisquil de papa*. These are known here at Coban as peruleros. They are quite small and rather wide and plump, pure white in color, mealy and dry." (*Johnson.*)

51057. BROMUS sp. Poaceæ. **Grass.**

From Santiago, Chile. Seeds presented by Sr. Badilla, through C. A. McQueen, commercial attaché, embassy of the United States of America. Received July 26, 1920.



THE BENNETT SOURSOP, A CHOICE VARIETY FROM COSTA RICA. (ANNONA MURICATA L., S. P. I. No. 51050.)

Superior forms of the soursop, a valuable fruit of the American Tropics, have not yet been established horticulturally. Practically all of the trees now growing throughout the world are seedlings. Since they vary in productiveness and in the character of their fruit it is a simple matter to select the best ones and propagate them by budding or grafting. The variety here illustrated is one which was grown at the Zent Farm of the United Fruit Company near Port Limon, Costa Rica, and is considered unusually valuable because of the large size and excellent quality of its fruits as well as the productiveness of the tree. (Photographed by Wilson Popenoe, Zent, Costa Rica, June 21, 1920; P17957FS.)



A SEEDLESS FORM OF THE PEJIBAYE, OR PEACH PALM, OF COSTA RICA. (GUILIELMA UTILIS OERST., S. P. I. NO. 51092.)

Because of the food value and delicious character of its boiled fruits, the pejibaye has long ranked among the important economic plants of Costa Rica. While each fruit normally contains a large bony seed, there are a few trees in San Jose which produce seedless fruits. These trees are propagated by suckers, in the same manner as the date palm. It is not yet certain, however, that the suckers will produce seedless fruits when grown in other climates than that of San Jose. (Photographed by Wilson Popenoe in the garden of Don José Zeledón, San Jose, Costa Rica, June 17, 1920; P17947FS.)

"Seeds brought in by Stafford Hamm, an American mining engineer, a gift from Sr. Badilla, who owns an estate in the high mountains. This grass is said to be extremely resistant to cold and to grow almost without moisture. It is a good soil binder on lands which are subject to high winds and occasional heavy rains." (*McQueen.*)

51058 to 51060.

From Chama, Alta Vera Paz, Guatemala. Seed presented by Harry Johnson. Received July 12, 1920. Quoted notes by Mr. Johnson.

51058. BEGONIA sp. Begoniaceæ. **Begonia.**

"(No. 190.) *Begonia scandens* of gardeners(?)."

51059. PIPER TUBERCULATUM Jacq. Piperaceæ. **Pepper.**

"(No. 188.) *Cordoncilla.* The dried flower spikes are used in the same manner as *Piper nigrum.* It is used here in the preparation of cha-al-cacao, a very good drink made by coarsely grinding the cacao with cinnamon and pepper. The flavor is a little different from black or white pepper and may be appreciated as a new condiment."

51060. HECKERIA sp. Piperaceæ. **Pepper.**

"(No. 189.) *Obel* (Kekchi name). The young leaves have a rather pleasant taste and are used to flavor fish, soups, stews, meats, etc. The plant is pretty when small, but soon grows 'leggy.' The large roundish leaves are green."

51061. CASSIA ELEGANS Voigt. Cæsalpiniaceæ.

From Cuzco, Peru. Seeds presented by A. A. Giesecke. Received July 15, 1920.

A shrubby ornamental Cassia with feathery pinnate leaves composed of obtuse lanceolate leaflets having yellowish midribs. Its original habitat is unknown, since the plant is known only in cultivation. (Adapted from *Voigt*, in *Sylloge Plantarum Ratisbonensi, vol. 2, p. 55.*)

51062 to 51068.

From East Melbourne, Victoria. Seeds presented by M. Medson. Received July 17, 1920.

51062. BACKHOUSIA CITRIODORA F. Muell. Myrtaceæ.

An Australian tree 18 to 20 feet high, with lemon-scented foliage like that of the scented verbena (*Lippia citriodora*). The essential oil from the leaves has been found suitable for scenting soaps, and the dried leaves give a very pleasant odor to linen closets, etc. The pinkish wood is hard and fine grained. (Adapted from *Maiden, Useful Native Plants of Australia, pp. 290, 381.*)

For previous introduction, see S. P. I. No. 33643.

51063. DORYANTHES PALMERI W. Hill. Amaryllidaceæ.

A beautiful member of the amaryllis family, native to Australia, where it grows to a height of 8 or 10 feet, with very numerous sword-shaped leaves up to 8 feet in length. The scarlet flowers are borne in a thyrsus about 3 feet long. (Adapted from *Curtis's Botanical Magazine, pl. 6665.*)

For previous introduction, see S. P. I. No. 23433.

51062 to 51068—Continued.

51064. EUCALYPTUS RISDONI Hook. f. Myrtaceæ.

A Tasmanian eucalypt rarely as tall as 50 feet, with smooth bark, pendulous branches, usually opposite lanceolate or heart-shaped leaves, and small flowers borne in axillary or lateral umbels. The wood is said to be rather poor. (Adapted from *Bentham, Flora Australiensis, vol. 3, p. 203*, and from *De Andrade, Manual do Plantador de Eucalyptos, p. 219.*)

51065. KENNEDIA MONOPHYLLA Vent. Fabaceæ.
(*Hardenbergia monophylla* Benth.)

An ornamental Australian leguminous vine with solitary obtuse leaflets up to 4 inches in length and numerous violet or rose-purple flowers borne in twos or threes in racemes. (Adapted from *Maiden, Flowering Plants and Ferns of New South Wales, pt. 1, p. 55.*)

For previous introduction, see S. P. I. No. 45790.

51066. SWAINSONA GALEGIFOLIA (Andrews) R. Br. Fabaceæ.
(*Colutea galegifolia* Sims.)

A low shrubby leguminous plant from New South Wales, with compound vetchlike leaves and scarlet-orange flowers borne on rather long axillary peduncles. (Adapted from *Curtis's Botanical Magazine, pl. 792.*)

The more common form in cultivation (variety *alba* Hort.) has pure white flowers.

51067. TELOPEA SPECIOSISSIMA (J. E. Smith) R. Br. Proteaceæ.
(*Embothrium speciosissimum* Smith.) **Waratah.**

An Australian shrub 6 to 8 feet high, with obovate, unequally serrate, dark-green leaves and a headlike spike of brilliant red flowers. It is propagated by layering or seeds. (Adapted from *Curtis's Botanical Magazine, pl. 1128.*)

For previous introduction, see S. P. I. No. 44837.

51068. TRICONDYLUS FRASERI (R. Br.) Kuntze. Proteaceæ.
(*Lomatia ilicifolia* R. Br.)

An erect branching shrub or sometimes a small tree, with ovate or lanceolate leaves, irregularly prickle toothed or lobed, and long, loose racemes of white or light-yellow flowers. The wood is light and very hard, with beautiful markings, and is easily worked. (Adapted from *Bentham, Flora Australiensis, vol. 5, p. 536*, and from *Maiden, Useful Native Plants of Australia, p. 564.*)

51069 to 51072.

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Gustav Helmrich. Received July 20, 1920. Quoted notes by Mr. Helmrich.

51069. ARUNDINELLA BERTERONIANA (Schult.) Hitchc. and Chase. Poaceæ. **Grass.**

"*Gjekerj* (tail of deer)."

"A tufted perennial grass with strong, slender, upright culms, 0.5 of a meter to 1 meter high, with long, narrow, folded, or involute blades and a many-flowered tawny panicle 20 to 30 centimeters long." (*Agnes Chase.*)

51069 to 51072—Continued.

51070. CHAETOCHLOA GENICULATA (Lam.) Millsp. and Chase. Poaceæ. **Grass.**

"*Culuc-k'im* (caterpillar grass)."

"A perennial grass producing short knotty branching rhizomes as much as 4 centimeters long. The culms are erect, spreading, or prostrate, up to 1 meter tall. The blades are flat, scabrous, and often glaucous, mainly straight, 20 centimeters long and 8 millimeters wide. The exserted panicle is yellow, purple, tawny, or greenish, 1 to 10 centimeters long and 4 to 8 millimeters thick. Native to open ground, salt marshes, and moist coast lands from Connecticut to Florida and Texas, in the interior north to Kansas and south through tropical America to Argentina and Chile." (*A. S. Hitchcock.*)

51071. CHAETOCHLOA SULCATA (Aubl.) Hitchc. Poaceæ. **Grass.**
(*Setaria sulcata* Raddi.)

"*Hotz-kor* (scrape-leaf)."

"A perennial grass with robust culms as much as 4 meters tall, with flat blades, 1 meter long and 10 centimeters wide at the middle, tapering at each end. The green or purplish panicles are often 70 centimeters long. Native to southern Mexico, northern South America and north in the Windward Islands to Guadeloupe." (*A. S. Hitchcock.*)

For previous introduction, see S. P. I. No. 38776.

51072. PASPALUM PANICULATUM L. Poaceæ. **Grass.**

"*Gua-djue* (fodder of roe)."

A weedy branching perennial, commonly 1 meter tall, with harshly pubescent flat blades 20 to 30 centimeters long and 1.5 centimeters wide and very numerous slender racemes crowded in oblong panicles. Native to open or partly shaded savannas, mostly moist ground from Mexico and the West Indies to South America. (Adapted from *Hitchcock and Chase, Contributions from the National Herbarium, vol. 17, p. 317.*)

51073. TRIFOLIUM RESUPINATUM L. Fabaceæ. **Clover.**

From Cairo, Egypt. Seeds collected for Prof. S. C. Mason, arboriculturist, United States Department of Agriculture, by Thomas W. Brown, director, Horticultural Division, Ministry of Agriculture. Received July 20, 1920.

"A small prostrate clover common in the sod of the parks and gardens around Cairo, usually in heavy soils." (*Mason.*)

51074 and 51075. BLAKEA spp. Melastomaceæ.

From San Jose, Costa Rica. Seeds presented by Doña Amparo de Zeledón. Received July 23, 1920. Quoted notes by Sra de Zelodón.

51074. BLAKEA sp.

"An epiphyte with very large carmine-magenta flowers."

51075. BLAKEA sp.

"An epiphyte with very large carmine-magenta flowers."

51076 to 51084.

From Batum, Transcaucasia, Russia. Seeds presented by John Palibin, director, Botanic Garden, through Charles K. Moser, American consul, Tiflis, Transcaucasia. Received July 23, 1920. Quoted notes by Mr. Palibin.

51076 to 51084—Continued.

51076. CICER ARIETINUM L. Fabaceæ. **Chick-pea.**

"Cultivated in the the western part of Transcaucasia, harvested in 1919."

51077 and 51078. CORYLUS AVELLANA L. Betulaceæ. **Hazelnut.**

51077. "*Kobuletti*, considered the best variety in the commerce of Batum. Harvested in 1919."

51078. "The thin-shelled kind from Trebizond. Harvested in 1919."

51079 to 51084. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

51079. "A good kind, cultivated in the Kutais district. A short, thick bean with reddish brown marks and splotches on a white ground."

51080 to 51084. "Best kinds in Georgia, Transcaucasia; the beans of the best varieties are those with lilac-colored spots. From the Botanical Gardens of Batum."

51080. 1. Lilac spots on a light-tan ground.

51081. 2. Lilac spots on a dark-tan ground.

51082. 3. Clear grayish tan with a dark ring around the hilum.

51083. 4. Brownish tan with dark ring around the hilum.

51084. 5. Long, slender, dark-red bean.

51085. PINUS HALEPENSIS PITYUSA (Stev.) Gordon. Pinaceæ. **Pine.**

From Sukhum Kale, Caucasus. Seeds presented by J. Muszynski, director, Botanic Garden. Received July 31, 1920.

A much-branched bushy pine, found in mountainous regions of the western Caucasus and Asia Minor, especially in Georgia. It attains a height of 6 to 10 meters, with numerous spreading whitish branches and slender twigs. The very slender leaves are about 12 centimeters long, and the ovoid, slightly bent cones are quite small. (Adapted from *Beissner, Handbuch der Nadelholzkunde, ed. 2, p. 421.*)

51086 to 51094.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received July 26, 1920. Quoted notes by Mr. Popenoe.

51086 to 51090. DAHLIA spp. Asteraceæ. **Dahlia.**

"(Nos. 425 to 429. July 6, 1920.) A collection of Costa Rican tree dahlias presented by Sr. Alfredo Brade, of San Jose. I believe there are at least two species represented. They will prove interesting to dahlia breeders."

51086. DAHLIA sp.

"(No. 425.) Large double lilac pink. Considered by Sr. Brade the finest variety of the collection, the flowers being very large and very double."

51087. DAHLIA sp.

"(No. 426.) Small-flowered half-double pale lilac pink. This variety flowers earlier in the season than the others in the set, and for this reason is of particular interest for California, where most of the tree dahlias are cut down by frost before they come into bloom."

51086 to 51094—Continued.

51088. DAHLIA sp.

"(No. 427.) Small double-flowered lilac. This variety flowers later than the others."

51089. DAHLIA sp.

"(No. 428.) Single white. This looks much like a form of *Dahlia maxonii*. The preceding three varieties all have leaves and stems tinged with purplish, and leaves distinct in form from the present number. In this variety and in No. 429 [S. P. I. No. 51090] the leaves are light green, with the leaflets long pointed."

51090. DAHLIA sp.

"(No. 429.) Double white, like the single white except that the flowers are double."

51091 and 51092. GUILIELMA UTILIS Oerst. Phœnicaceæ. **Palm.**
(*Bactris utilis* Benth. and Hook.)

51091. "(No. 424. July 6, 1920.) Plants of the *seedless pejibaye*. I have already described the pejibaye in connection with a shipment of seeds made under No. 391a [S. P. I. No. 50679]. The suckers or offshoots sent under the present number, however, are of a choice seedless form growing in the garden of Sr. Alfredo Brade, in San Jose. Sr. Brade has generously presented us with the only two offshoots at present available, in the hope that they will grow in Florida. The *seedless pejibaye* is rare in Costa Rica, and very highly esteemed, as it should be. Its propagation must necessarily be slow, because of the very few offshoots which each palm produces. The only question is, will the progeny of these palms invariably retain the valuable characteristic of seedlessness? It seems possible that seedlessness may be due, in some instances at least, to local peculiarities of climate which affect the pollination of the flowers; and in such instances, the characteristic will not, of course, be heritable. The matter has not yet been sufficiently investigated, however, to permit any conclusions to be reached; and for the present we should make an effort to test all available seedless forms in our tropical dependencies and in southern Florida."

For previous introduction, see S. P. I. No. 44268.

51092. "(No. 431. July 6, 1920.) Plants of *seedless pejibaye*, presented by Doña Amparo de Zeledón, of San Jose. See remarks concerning seedless pejibayes under No. 424 [S. P. I. No. 51091]. The offshoots forwarded under the present number have been obtained for us by Sra de Zeledón from palms known by her to produce seedless fruits. The value of her gift can be appreciated only by those who know how difficult it is to procure offshoots of the seedless pejibaye."

For previous introduction, see S. P. I. No. 44268.

Fruits of this seedless form are shown in Plate VIII.

51093. PASSIFLORA QUADRANGULARIS L. Passifloraceæ. **Giant granadilla.**

"(No. 430. July 6, 1920.) Cuttings of *granadilla real*. From the garden of Sr. Alfredo Brade, in San Jose. Sr. Brade states that this vine is

51086 to 51094—Continued.

a free bearer, a condition quite rare with *Passiflora quadrangularis*. It is introduced for trial because of the possibility of its proving better than the average form."

51094. RUBUS ERIOCARPUS Liebm. Rosaceæ. **Raspberry.**

"(No. 423a. July 6, 1920.) Seeds of *mora*. From the upper slopes of the Volcano Irazu, at 9,000 to 10,000 feet altitude. This berry, which is found only at altitudes of 9,000 feet and higher, is quite distinct from the several species which I have collected in Costa Rica at lower levels, mainly between 4,000 and 6,000 feet. It is more of a raspberry than a blackberry in character. The slender canes, which are of a deep reddish green color, grow to 8 or 10 feet in length and branch profusely, forming an impenetrable tangle. The leaves are trifoliolate and the flowers small and white. The fruits, which are produced in good-sized clusters, are oblong or oblong-oval, up to an inch in length, and composed of numerous small deep-red drupelets. The flavor is distinctly that of the raspberry and is very agreeable. The plant is a profuse bearer, and seems well worthy of trial in the southern United States."

51095 to 51097.

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Gustav Helmrich. Received July 31, 1920. Quoted notes by Mr. Helmrich.

51095. ISCHAEMUM LATIFOLIUM (Spreng.) Kunth. Poaceæ. **Grass.**

"*Cux-kub* (Indian). A very good fodder for horses."

A stout decumbent grass, rooting at the lower nodes, with glabrous blades 20 centimeters long and 3 centimeters wide and a fan-shaped inflorescence. Native to moist shady places in southern Mexico and the Lesser Antilles to Brazil and Ecuador. (Adapted from *Hitchcock and Chase, Contributions from the U. S. National Herbarium, vol. 18, p. 332.*)

51096. PASPALUM HUMBOLDTIANUM Fluegge. Poaceæ. **Grass.**

"*Taki pachadja* (white grass)."

"A handsome perennial grass producing strong scaly rootstocks, with tufted culms, 40 to 80 centimeters high, erect from a woody, decumbent base. The nodes are densely bearded with upwardly appressed white hairs; the flat, spreading blades, 8 to 18 centimeters long, 8 to 15 millimeters wide, are slightly narrowed toward the base into a stiff point. The margins are usually stiffly fringed with hairs, and the panicles, 10 to 15 centimeters long, are of pale lax, spreading spikelets, beautifully fringed with long, white glistening hairs. Native to rocky ground on the highlands from central Mexico to Argentina." (*Agnes Chase.*)

51097. PANICUM MULTIRAMEUM Scribn. Poaceæ. **Grass.**

"*Chachach onim* (basket grass)."

A delicate grass with small open primary panicles of pubescent spikelets, lanceolate blades less than 10 times as long as broad, and basal leaves which are distinctly different from those of the culm, forming a winter rosette; the culms are at first simple, later becoming much branched. The autumnal phase is decumbent with the branches in fan-shaped clusters. Native to banks and dry, open ground from southern Mexico to Guatemala, and also in Jamaica. (Adapted from *Hitchcock and Chase, Contributions from the U. S. National Herbarium, vol. 18, p. 332.*)

51098. CONVOLVULUS MAURITANICUS Boiss. Convolvulaceæ. **Morning-glory.**

From Pasadena, Calif. Plants presented by D. W. Coolidge, Coolidge Rare-Plant Gardens. Received August 4, 1920.

The blue rock bindweed is one of the most beautiful and graceful of all our hardy bindweeds. It is entirely free from rampant tendencies and is remarkable for its persistent flowering and neat elegant habit. Each plant forms a dense tuft and throws up innumerable long drooping shoots, each terminated by a cluster of clear blue flowers. Easily grown from cuttings. (Adapted from *The Garden, vol. 39, p. 52.*)

51099. PASSIFLORA MACROCARPA Masters. Passifloraceæ.

From Trujillo, Peru. Seeds presented by A. Martin Lynch, Sayapullo. Received August 9, 1920.

"The fruit grows to the size of a man's head and is one of the most delicious fruits grown in Peru, where the juice and pulp are made into a most delicious beverage." (*Alberto Larco Herrera.*)

51100. SYZYGIUM CUMINI (L.) Skeels. Myrtaceæ. **Jambolan.** (*Eugenia jambolana* Lam.)

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received August 11, 1920.

"Seeds of the *duhat*, one of our most popular small fruits." (*Wester.*)

A tropical Asiatic tree 8 to 15 meters high, with ovate, coriaceous, shining leaves and numerous yellow flowers crowded in terminal or axillary panicles followed by loose clusters of 2 to 7 dark-purple or black, smooth, shining, ovoid fruits, 25 millimeters long and 20 millimeters across, with rather large clingstone seeds. The thin skin adheres to the sweet, juicy, pleasant, subacid pulp which is white tinged with purple; the texture somewhat resembles that of the cherry. The sugar content is 12.20 per cent, the protein 0.80 per cent, and the acidity (as malic acid) 87 per cent. The fruit may be eaten out of hand with relish, and it makes an excellent jelly. In India it is sometimes made into wine. It is probably of prehistoric introduction into the Philippines and is common throughout the archipelago. (Adapted from *The Philippine Agricultural Review, vol. 10, p. 13.*)

For previous introduction, see S. P. I. No. 43217.

51101. CORDIA sp. Boraginaceæ.

From Santiago de las Vegas, Cuba. Seeds presented by Gonzalo M. Fortun, director, Agricultural Experiment Station. Received August 17, 1920.

"A plant generally known in Cuba as *romitel;* it is also called *gutaperi.* The fruits of this plant are edible, and we were told that an excellent preserve is made from them. The tree when loaded with its glorious heads of crimped, salver-shaped orange flowers makes a magnificent appearance." (*Fortun.*)

51102. CUCUMIS MELO L. Cucurbitaceæ. **Muskmelon.**

From Paris, France. Seeds presented by Prof. S. C. Mason, arboriculturist, United States Department of Agriculture. Received August 17, 1920.

"Immediately after arriving in Paris I noticed peculiar and very fine cantaloupe melons displayed in the windows of the groceries, as we would call them.

These melons continue all through August, they tell me, and are grown in open gardens, though I suspect that they are started in frames. They are roundish, a good deal oblate, deeply ribbed, inclined to be rough and warty (but not netted), and have a very distinct 'areole' (or smooth circle) around the calyx, sometimes as much as 2 inches in diameter. They range in size, apparently the same variety, from 4 inches in diameter up to 8 or even 9 inches, and in retail price from 2½ to 12, 14, and even as high as 17 francs for the finest specimens. In good restaurants one portion (about 8 or 10 to a large melon) is served for 4½ francs. The melons are picked when they become a mottled gray-green in color, never being allowed to ripen on the vines. They appear to carry remarkably well, but when well matured they are a dirty yellow color, not very attractive. The flesh is rich orange-yellow, thick, firm, not at all netted, and only moderately sweet but very satisfying. I am sending you the entire lot of seeds from one, of which I had a portion in the Grand Café de l'Alma, close to the Ponte l'Alma. I am sure I have never seen a melon anything like this type in the United States." (*Mason.*)

51103 and 51104. AMYGDALUS COMMUNIS L. Amygdalaceæ.
(*Prunus amygdalus* Stokes.)

From Gedera (Katra), near Jaffa, Palestine. Budwood presented by Amram Khazanoff. Received August 17, 1920. Quoted notes by Mr. Khazanoff.

"The two standard almond varieties of Palestine, which I consider worthy of the interest of almond growers in the United States. This budwood was selected with a view to possible bud variation."

51103. "*Greek* almond." **51104.** "*Victoria* almond."

51105. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

From Rio Frio, near Santa Marta, Colombia. Budwood collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received August 19, 1920.

"(No. 432. Avocado No. 46. August 5, 1920.) A very choice variety of avocado, said to be the earliest known in the Rio Frio region. This is a fine oval fruit, green in color, about 1½ pounds in weight, with thick meat of excellent quality." (*Popenoe.*)

51106. OTOPHORA FRUTICOSA (Roxb.) Blume. Sapindaceæ.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received April 24, 1920. Numbered August 30, 1920.

"*Balinaonao.* A small tree with dark-red to black fleshy fruits about one-third the size of grapes, in bunches like grapes, up to 200 fruits in a bunch. The flesh is sweet and edible but rather insipid. The seeds taste like chestnuts roasted and are eaten to a slight extent. The plant is of slight economic value but is quite ornamental in the fruiting season by reason of its large bunches of dull rose-red fruits. The tree grows at Lamao and may succeed in Florida." (*Wester.*)

51107 to 51109.

From Buenos Aires, Argentina. Seeds presented by Benito Carrasco, director, Botanic Garden. Received July 12, 1920.

51107. ASPIDOSPERMA PEROBA Sald. Gama. Apocynaceæ.

This tree, whose wood is used in naval construction, has a thin, clear ash-colored bark, cracked longitudinally; a decoction of the inner bark is used medicinally. The heartwood is of rare beauty, with a wavy pattern. The tree is distinguished by its spreading, obovate-oblong, undulate leaves. (Adapted from *Saldanha da Gama, Configuracão descripcão de todos os orgãos fundamentaes das principaos madeiras . . . da Provincia do Rio de Janeiro, vol. 1, p. 140.*)

For previous introduction, see S. P. I. No. 42324.

51108. GOMPHRENA ROSEA. Griseb. Amaranthaceæ.

An herbaceous perennial, erect or ascending, found in stony situations in Cordoba, Argentina. The leaves are lanceolate and rather short, and the pinkish flowers are borne in a terminal head. (Adapted from *Grisebach, Plantae Lorentzianae, p. 32.*)

For previous introduction, see S. P. I. No. 33966.

51109. PETUNIA VIOLACEA Lindl. Solanaceæ. **Petunia.**

This petunia is a native of Buenos Aires, Argentina. With its dark-green oval leaves and profusion of purple flowers which appear from August to October in its native habitat, it forms a most attractive ornamental plant. (Adapted from *Edwards' Botanical Register, pl. 1626.*)

51110. AELUROPUS BREVIFOLIUS (Koen.) Nees. Poaceæ. **Grass.**

From Cairo, Egypt. Seeds presented by Dr. R. H. Forbes, Société Sultanienne d'Agriculture. Received September 8, 1920.

"A dwarf creeping grass with dense globose flower clusters, growing in saline soil both on the seacoast and inland from the Mediterranean coasts to Afghanistan and India. The species is very variable, with both glabrous and pubescent forms. Duthie in 'The Fodder Grasses of Northern India,' says of it: 'It is characteristic of saline tracts in the western parts of India, where it appears to take the place of dub (*Cynodon dactylon*), which it somewhat resembles in habit.'" (*C. V. Piper.*)

Introduced for testing as a lawn grass under alkaline conditions.

51111. ANTHEPHORA PUBESCENS Nees. Poaceæ. **Grass.**

From Pretoria, Transvaal. Seeds presented by Sydney Steub, Division of Botany, Department of Agriculture. Received August 24, 1920.

"Considered one of the best pasture grasses in parts of Bechuanaland where it grows." (*Agricultural Journal of South Africa, vol. 3, No. 17, p. 135.*)

51112. XANTHOSOMA SAGITTAEFOLIUM (L.) Schott. Araceæ. **Yautia.**

From Buitenzorg, Java. Tubers presented by Dr. J. C. Koningsberger, director, Botanic Garden. Received September 18, 1920.

"Received under the varietal name *romah*, which, according to a previous introduction (S. P. I. No. 17238) is a Colocasia." (*R. A. Young.*)

51113 to 51115.

From Rawalpindi, Punjab, India. Seeds presented by Dr. R. R. Stewart, Gordon College. Received July 7, 1920. Quoted notes by Doctor Stewart.

51113. TULIPA STELLATA Hook. Liliaceæ. **Tulip.**

A very delicate species which is certainly a valuable acquisition to our gardens. It is remarkable for the narrowness of the petals and their spreading out almost flat in the middle of the day when the sun shines, and closing again in the evening. The small broadly ovate bulb, capped with three or four lanceolate segments thickly lined with fulvous hair, flowers in two months. In India, where the plant is common, the bulbs are frequently eaten by natives and are sold for that purpose in some of the bazaars. The terete, glaucous stem, nearly 2 feet high in the cultivated species, bears four to five linear-lanceolate leaves. The dainty, erect flowers, oblong in the bud, are solitary or two upon the same stem. The lanceolate, concave petals are pure white, with a faint tinge of pink and green at the points, on the outside, and bright yellow at the base within. Three of the petals are longer than the rest and sometimes have a single tooth. (Adapted from *Curtis's Botanical Magazine, pl. 2762;* and *Watt. Dictionary of the Economic Products of India, vol. 6, pt. 4, p. 203.*)

51114. ZIZIPHUS JUJUBA Mill. Rhamnaceæ. **Jujube.**
(*Z. sativa* Gaertn.)

"Wild jujube bought in market. A form widely cultivated in the Punjab."

51115. ZIZIPHUS sp. Rhamnaceæ. **Jujube.**

"Wild jujubes bought in market."

51116 to 51125.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received July 14, 1920. Quoted notes by Mr. Popenoe.

51116. BUNCHOSIA GLANDULIFERA H. B. K. Malpighiaceæ.

"(No. 412. July 1, 1920.) *Cereza.* Plants presented by Carlos Wercklé, of El Coyolar, Costa Rica.

"A small, slender tree, reaching about 20 feet in height. It bears short racemes of yellow flowers which are followed by elliptic, bright-red fruits about 1 inch long. Mr. Wercklé thinks the fruit nearly as good in quality as that of the Japanese persimmon; in my opinion, however, it is considerably inferior. The thin skin surrounds a large elliptic seed and a small quantity of red pulp which, like that of the persimmon, must not be eaten until it is very soft."

51117. CASTILLA NICOYENSIS O. F. Cook. Moraceæ. **Nicoya rubber.**

"(No. 416a. July 1, 1920.) Seeds collected from a tree in the dooryard of the ranch house at El Coyolar, Costa Rica. It is a Central American rubber tree, said to be a more vigorous grower than *Castilla elastica* and less exacting in its soil requirements."

For previous introduction, see S. P. I. No. 42386.

51116 to 51125—Continued.

51118. CORDIA NITIDA Vahl. Boraginaceæ.

"(No. 415a. July 1, 1920.) Seeds of *muñeco*. The muñeco is commonly planted in and about San Jose as a street tree, or as an ornamental tree in parks and gardens. It reaches a height of 40 feet, and forms a broad, shapely crown of deep-green foliage. It is quick growing and rather soft wooded, so that limbs are sometimes broken off by storms. The orange-red fruits, which are produced in clusters 4 to 6 inches across, are individually the size of small cherries. They are not edible, but since they remain on the tree a long time they are of decorative value."

51119. CROTALARIA VERRUCOSA L. Fabaceæ.

"(No. 413a. July 1, 1920.) Seeds of a plant found abundantly at Puntarenas, in abandoned or uncultivated places close to the seashore. It seems less woody in character than *Crotalaria retusa*, and likely, therefore, to make a better crop for use as a green manure. It reaches about 18 inches in height, and bears attractive white and pale-blue flowers. Evidently it is an annual. It should be tested as a cover crop in the South, especially on sandy lands."

51120. CUPANIA sp. Sapindaceæ.

"(No. 414a. July 1, 1920.) *Paraiso*. Seeds presented by Carlos Wercklé, of El Coyolar, Costa Rica. Mr. Wercklé states that this is a handsome ornamental tree, indigenous in the region about Coyolar, and probably not described botanically. It should be tested in southern Florida."

51121. PASPALUM NOTATUM Fluegge. Poaceæ. **Grass.**

"(No. 418a. July 1, 1920.) *Gengibrillo*. Seeds presented by Alfredo Quiros. From sea level up to 5,000 feet this is probably the most important of the pasture grass cultivated in Costa Rica; above 5,000 or 6,000 feet it is injured by frost and is not, therefore, extensively planted. In the lowlands it is especially esteemed; it makes a compact sod, crowding out weeds and other grasses, and affording an abundance of nourishing green forage, eaten readily by both horses and cattle. It rarely grows more than a foot in height, and where pastured constantly does not often reach more than 6 inches. For trial in the Everglades region of southern Florida."

For previous introduction, see S. P. I. No. 37996.

51122. POLAKOWSKIA TACACO Pittier. Cucurbitaceæ.

"(No. 422. July 1, 1920.) Seeds of *tacaco*. Among Costa Ricans this is one of the most popular of all vegetables, and it is regularly sold in the market of San Jose during a large part of the year.

"In general character the tacaco suggests the chayote. The plant, which is commonly cultivated on arbors or allowed to climb over trees, has a leaf resembling that of the chayote in shape but differing in texture; and the fruit, which falls to the ground when mature, is about 3 inches long, elliptic in outline. Frequently it has a few short spines about the base; elsewhere it is smooth. When boiled it is considered to have a richer flavor than the chayote, but the flesh is somewhat fibrous.

"The tacaco should be tried in the chayote-growing regions of the United States. Doubtless it would be possible to reduce the proportion of fiber and otherwise improve the fruit by selection."

For previous introduction, see S. P. I. No. 47329.

51116 to 51125—Continued.

51123. RUBUS ADENOTRICHOS Schlecht. Rosaceæ.

"(No. 417a. July 1, 1920.) *Mora.* Seeds of a wild blackberry from the roadside between Cartago and Tierra Blanca, at an altitude of about 6,000 feet. A vigorous, bushy species reaching about 8 feet in height and producing in abundance blackberries somewhat less than 1 inch long and of good flavor. Of especial interest for breeding purposes."

51124 and 51125. WERCKLEA INSIGNIS Pitt. and Standl. Malvaceæ.

51124. "(No. 419. July 1, 1920.) Cuttings presented by Dr. Ricardo Jiménez Núñez, of Guadalupe, San Jose. A rare and handsome plant, discovered a few years ago in the mountains near La Palma, Costa Rica. It is an arborescent shrub about 15 feet in height, usually branching close to the ground to form several main limbs, which in turn branch (though sparingly) to form long stiff shoots, each crowned with a cluster of orbicular leaves nearly a foot in breadth. The flowers, which appear among the leaves at the ends of the branches, are similar in size and form to those of *Hibiscus rosa-sinensis*, the common hibiscus of the Tropics. In color, however, they are quite distinct from those of the hibiscus, being bright lilac, turning to golden in the throat. Since it is found in Costa Rica at an altitude of 5,000 feet, the species may be sufficiently hardy to succeed in southern Florida. It probably requires a moist climate, and in its indigenous condition it grows upon heavy soil."

51125. "(No. 419a. July 1, 1920.) Seeds of the shrub of which cuttings were sent under No. 419 [S. P. I. No. 51124]."

51126. MANIHOT ESCULENTA Crantz. Euphorbiaceæ. **Cassava.** (*M. utilissima* Pohl.)

From Honolulu, Hawaii. Cuttings presented by J. M. Westgate, agronomist in charge, Agricultural Experiment Station. Received August 10, 1920.

"*Wiebke* cassava. A very superior variety from the island of Kauai, selected from volunteer seedlings by a man named Wiebke, in whose honor the variety has been named. Not only does it yield better than three long-established varieties [*Sweet*, white, early-maturing culinary cassava; *Bitter*, red, late-maturing stock-feed cassava; *Martin's Intermediate* cassava], but it also has the habit of remaining tender or at least not becoming woody as do most of our varieties if left growing several months after maturity.

"*Wiebke* cassava promises to be superior to any of the above-mentioned varieties for culinary, feeding, and starch-manufacturing purposes. Harvested on June 15, at the end of a 15-month growing period, at the Haiku substation, it yielded 17,776 pounds per acre of clean roots. This result was obtained on rough pineapple land, without fertilization and with little or no cultivation aside from the initial plowing under of the old pineapple stumps and one cross-plowing.

"In an 18-month growing period completed in August, 1920, on soil fertilized with 500 pounds of phosphates, half super and half reverted, the *Wiebke* cassava yielded 19,111 pounds of roots per acre; on soil fertilized with 1,000 pounds of phosphates, half super and half reverted, it yielded 22,211 pounds of roots per acre. The starch recovered was 20 per cent. The crops were grown on old pineapple land with a view to testing their adaptation as a rotation crop." (*F. G. Krauss.*)

51127 to 51141.

From Buitenzorg, Java. Seeds presented by Dr. I. Boldingh, acting head of the Division of Plant Breeding, Java Department of Agriculture. Received August 20, 1920.

51127. ARECA CATECHU L. Phœnicaceæ. **Betel-nut palm.**

Variety *alba*. The species is one of the most important and valuable palms and is widely distributed throughout the East; it forms an erect, slender stem, bearing at its summit a crown of graceful leaves, among which hang great clusters of egg-shaped fruits, each one formed when ripe of a thick fibrous pericarp, inclosing one seed about the size and shape of an ordinary nutmeg. Native to Cochin China and the Malay Archipelago; it does not succeed at any distance from the sea nor at an altitude above 3,000 feet. The average yield of a betel-nut palm is estimated at 300 fruits. The chief use of the seed is as an ingredient in the preparation of pan for chewing, a universal practice among all classes. The seed or nut is found in all the bazaars either whole, sliced, or cut into small pieces, the chewing of which is said to stimulate digestion and to prevent dysentery. In the preparation of pan use is made of lime, catechu, cardamoms, cloves, and other ingredients. Areca nuts are used in medicine because of their astringent properties, and when reduced to charcoal and finely powdered they are also used as a dentifrice. (Adapted from *The Garden, vol. 64, p. 282.*)

51128. CARYOTA MITIS Lour. Phœnicaceæ. **Palm.**

A palm, 15 to 25 feet in height, with a low, stoloniferous stem and scurfily villous petioles, leaf sheaths, and spathes; the few, very large, broad, bipinnatisect leaves are 4 to 9 feet long. The bluish black fruits are half an inch in diameter. Native to Mauritius. (Adapted from *Baker, Flora of Mauritius and the Seychelles, p. 423.*)

For previous introduction, see S. P. I. No. 24616.

51129. DAMMARA ALBA Rumph. Pinaceæ.
(*Agathis loranthifolia* Salisb.)

A splendid tree, up to 100 feet high, with a stem 8 feet in diameter, straight and branchless for two-thirds of its length. It is of great importance on account of its yield of the transparent dammar resin, extensively used for varnish. Native to the Indian Archipelago and mainland, extending to the Philippine Islands. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 161.*)

For previous introduction, see S. P. I. No. 34071.

51130. DRYMOPHLOEUS sp. Phœnicaceæ. **Palm.**

Received as *Actinophloeus macarthurii*, for which a place of publication has not been found.

51131. LATANIA COMMERSONII Gmel. Phœnicaceæ. **Palm.**

A diœcious palm 40 feet high, native to Mauritius, with dark-green fan-shaped leaves, 3 feet long, paler beneath, the blade deeply laciniate; the veins and margins of the lanceolate segments are tinged with red. The petioles, 4 to 6 feet long, are slightly tomentose with smooth margins, spiny in young plants. The globose drupes are 1½ inches in diameter. (Adapted from *Baker, Flora of Mauritius and the Seychelles, p. 381.*)

For previous introduction, see S. P. I. No. 45960.

51127 to 51141—Continued.

51132. LICUALA RUMPHII Blume. Phœnicaceæ. **Palm.**

A showy dwarf fan palm grown for its peculiar habit and handsome foliage. The slender stem bears a crown of long-petioled roundish leaves, 3 or more feet in diameter, with 12 to 15 segments, the inner ones 2 feet long and 1 foot wide at the apex, the lateral ones, 16 inches long and 4 inches wide, oblique; the petioles are spiny below. The simply branched spadix, 4 to 5 feet long, bears ellipsoid fruits. Native to Celebes and Borneo. (Adapted from *Blume, Rumphia, vol. 2, p. 41.*)

51133. NEPHROSPERMA VAN-HOUTTEANUM (Wendl.) Balf. f. Phœnicaceæ. **Palm.**

A monœcious palm, 20 to 35 feet high, native to the Seychelles, with pinnate glabrous leaves, 5 to 7 feet long, and leaflets 3 to 3½ feet in length; the smooth petiole is under a foot long and the woolly, sparsely spiny leaf sheath is 1½ to 2½ feet long. The spadix is 4 to 8 feet long and bears orange-red fruits, half an inch in length. (Adapted from *Baker, Flora of Mauritius and the Seychelles, p. 386.*)

For previous introduction, see S. P. I. No. 45965.

51134. ONCOSPERMA FILAMENTOSUM Blume. Phœnicaceæ. **Palm.**

A very elegant palm with a trunk 30 to 40 feet high, distinctly annulate and armed, and a thick, graceful crown. The pinnate leaves are 10 to 12 feet in length with pinnæ about 2 feet long. This palm is quite common on the borders of paddy swamp in Malacca. (Adapted from *Calcutta Journal of Natural History, vol. 5, p. 464.*)

For previous introduction, see S. P. I. No. 45962.

51135. PANDANUS FURCATUS Roxb. Pandanaceæ.

Variety *lais.*

This screw pine occurs in India up to altitudes of 4,000 feet, and will be likely to bear a temperate climate and give a stately plant for scenic group planting. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 347.*)

51136. PANDANUS LABYRINTHICUS Kurz. Pandanaceæ.

A shrub 15 to 20 feet in height, with erect-spreading branches and a slender, warty, glabrous stem sending out stiltlike, intricate aerial roots. The somewhat leathery linear leaves, 4 to 6 feet long, are shining above, glaucescent below, the margin and midrib densely spiny with curving white spines. The green, linear spathes inclose the eight to nine spikes of elliptic, oblong, drooping fruit clusters. The drupes are shining olive green, finally golden. (Adapted from *Miquel, Annales Musei Botanici Lugduno-Batavi, vol. 2, p. 53.*)

51137. PANDANUS POLYCEPHALUS Lam. Pandanaceæ.

A small dicœcious Indian tree with spiny-margined, trifarious, narrow, coriaceous leaves. The red, spicate, subglobose drupes have spinescent crowns. (Adapted from *Hooker, Flora of British India, vol. 6, p. 487.*)

Received as *Pandanus kurzianus*, which is now generally referred to *P. polycephalus.*

51138. PANDANUS TECTORIUS Parkins. Pandanaceæ.

"*Aggak.* A small tree with a trunk which usually begins to branch very low, the branches often bending downward nearly to the ground;

51127 to 51141—Continued.

the leaves are long, sword shaped, armed with spines on the margin and keel, differing in color and texture from those of Guam, being glaucous and of great textile strength. Only one sex occurs on the island, so that it must be propagated by cuttings. These take root readily; indeed, a branch lying on the surface will often send out roots which penetrate the ground. The natives frequently plant this species in hedges, which serve the double purpose of defining their boundaries and of furnishing material for cordage and for mats, hats, and bags.

"Dried leaves stripped of the rigid, spiny keel are used either in their simple form or twisted together as lashings for the framework of buildings and for securing thatch to the roof. For making mats, hats, and bags, the leaves are steeped in hot water, scraped, and split into strips of various widths according to the fineness of the fabric desired, dried in the sun, and thoroughly cleaned. Mats are braided with the strips crossing diagonally, as in the mats of the eastern Polynesians, not woven with warp and woof, as are the mats of many of the Micronesians. Some of the hats and small bags are very fine. In the early days the natives of Guam made their sails of aggak leaves. The plant was undoubtedly introduced into the island in prehistoric times." (*Safford, Useful Plants of Guam, p. 344.*)

For previous introduction, see S. P. I. No. 44779.

51139. ROYSTONEA REGIA (H. B. K.) O. F. Cook. Phœnicaceæ.
(*Oreodoxa regia* H. B. K.) **Cuban royal palm.**

The royal palm grows wild throughout the Antilles and also in southern Florida, Mexico, Central America, and in the northern part of South America. It is especially abundant on damp, fertile soil, such as is suitable for tobacco cultivation. In the west of Cuba it is found on land which was formerly cultivated but has since been abandoned. The trunk is often 70 to 85 feet high, with a diameter of nearly 2 feet. The wood is considered unsuitable for constructive purposes, but the external layer of hard wood is much used for walking sticks, stakes, fences, posts, tables, coffee mortars, and the partition walls of houses. The most useful portion of the tree is the yagua, or dried leafstalk. The large terminal leaves have clasping leafstalks, 4 to 9 feet long, and as wide as the circumference of the stem. Every three or four weeks a leaf falls; this is damped, flattened by means of weights, and dried. The dried leafstalks are sold per truss and provide the best packing material for export tobacco. The leaf bases supply a fiber from which ropes and string are made. In Cuba yagua is also used in the construction of the poorest houses. The terminal bud is edible, but its removal causes the death of the tree. This is one of the most elegant palms for planting in avenues. (Adapted from *La Hacienda, vol. 8, p. 91.*)

For previous introduction, see S. P. I. No. 34747.

51140. SCHEELEA INSIGNIS (Mart.) Karst. Phœnicaceæ. **Palm.**

A palm with an erect stem, 50 to 60 feet in height, with 15 to 20 smooth, erect, pinnate fronds crowded into a dense crown. The yellowish green, smooth, fleshy, pistillate flowers are sessile on a spadix inclosed in a green spathe. The pale yellowish white, staminate flowers are inconspicuous. (Adapted from *Martius, Historia Naturalis Palmarum, vol. 2, p. 133.*)

51127 to 51141—Continued.

51141. TILMIA CARYOTAEFOLIA (H. B. K.) O. F. Cook. Phœnicaceæ. (*Martinezia caryotaefolia* H. B. K.) **Palm.**

Spiny fishtail. A small graceful Colombian palm, 30 feet in height, with an erect, closely ringed stem copiously armed with slender stiff black spines, 2 to 3 inches long; the rachis and midribs also bear these spines, though not so profusely. The spreading and drooping bright-green pinnate leaves, 4 to 5 feet long, are terminal. Each elongate leaflet is 9 to 12 inches long, more or less 3-lobed, and inserted by a broad base to the scurfy rachis. The yellow-green pistillate flowers are followed by globose drupes. (Adapted from *Curtis's Botanical Magazine, pl. 6854.*)

For previous introduction, see S. P. I. No. 25944.

51142. GUNDELIA TOURNEFORTII L. Asteraceæ.

From Jerusalem, Palestine. Seeds presented by Mr. J. Ettinger, director, Agriculture and Colonization Department, Zionist Commission. Received August 21, 1920.

Accoub de Syrie. A spiny composite from Persia with buttonlike flower buds, about the size of a large strawberry, which, when boiled and served with butter, make an extremely satisfactory dish. This delicious vegetable is said to be the equal of asparagus and more delicate in flavor than artichokes. The plant is perennial, requires four years to attain maximum production, and is as long lived, perhaps, as asparagus. (Adapted from *Bulletin, Société de National Acclimatation de France, vol. 34, p. 450.*)

51143 to 51154.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky, Jardin d'Acclimatation. Received August 24, 1920. Quoted notes by Doctor Proschowsky.

51143. ALBIZZIA CHINENSIS (Osbeck) Merr. **Mimosaceæ.** (*A. stipulata* Boiv.)

"A small tree."

For previous introduction, see S. P. I. No. 42356.

51144. ELAEODENDRON CAPENSE Eckl. and Zeyh. Celastraceæ.

"A small evergreen tree of very regular, straight growth; very hardy here."

51145. GENISTA MONOSPERMA (L.) Lam. Fabaceæ.

"A very graceful bush, much cultivated here for its beautiful white, fragrant flowers which are exported in early spring. Very resistant to drought."

For previous introduction, see S. P. I. No. 10698.

51146. GLADIOLUS SEGETUM Ker. Iridaceæ. **Gladiolus.**

"One of the most beautiful wild flowers here. Might perhaps be used for hybridization, if such has not yet been the case."

For previous introduction, see S. P. I. No. 27844.

51147. GREWIA OCCIDENTALIS L. Tiliaceæ.

"A large evergreen bush with violet flowers."

51148. LIMONIUM FRUTICANS (Webb) Kuntze. Plumbaginaceæ. (*Statice fruticans* Webb.) **Sea lavender.**

51143 to 51154—Continued.

"One of the plants cultivated here in early spring for cut flowers for export. Will grow in the driest places. Needs sunny exposure."

For previous introduction, see S. P. I. No. 48030.

51149. MALVASTRUM CAPENSE (L.) Garke. Malvaceæ.

"An evergreen bush with rose-colored flowers."

51150. RONDELETIA AMOENA (Planch.) Hemsl. Rubiaceæ.

"An evergreen bush or small tree with beautiful rose-colored flowers; hardy here."

51151. SPARTIUM JUNCEUM L. Fabaceæ. Spanish broom.

"Bush of very regular globular growth when in open ground. One of the glories of the Mediterranean vegetation, when covered with its thousands of light-yellow flowers."

For previous introduction, see S. P. I. No. 43666.

51152 to 51154. WIGANDIA spp. Hydrophyllaceæ.

"These Wigandias, forming bushes several meters in height, are naturalized in my garden and spring up everywhere, especially on vertical walls, slopes, etc. They are strikingly ornamental with their enormous evergreen leaves and abundant flowers."

51152. WIGANDIA CARACASANA H. B. K.

"A plant with large dark-green leaves and violet flowers."

For previous introduction, see S. P. I. No. 43671.

51153. WIGANDIA sp.

"A plant with large, dark yellowish green leaves and violet flowers. In distinction from other Wigandias, this species has no stinging hairs."

Received as *W. chilensis*, a horticultural name for which a place of publication has not been found.

51154. WIGANDIA sp.

"This plant bears large grayish green leaves covered on the under side with white tomentum."

Received as *W. imperialis*, a horticultural name for which a place of publication has not been found.

51155. MADHUCA INDICA Gmel. Sapotaceæ. Mowra tree.

(*Bassia latifolia* Roxb.)

From Allahabad, India. Seeds presented by William Bembower, Allahabad Agricultural Institute. Received August 24, 1920.

Mowra. One of the most useful plants found in the plains and forests of the East Indies; the tree yields food, wine, and oil. It is 40 to 50 feet high, with a short trunk and numerous spreading branches, forming a close, shady, rounded crown. It thrives on dry and stony ground in all parts of central India and is protected by the natives. The part eaten, the succulent corolla, is rich in sugar and is highly valued as a foodstuff and as the source of a spirituous liquor. Some conception of the value put upon the flowers for these purposes by the natives is gained from an estimate made some years ago, that in the Central Provinces over 1,000,000 people used these corollas as a regular article of food, each person consuming about 80 pounds per annum; throughout India they are looked upon as a valuable reserve in famine years.

The *mowra* tree sheds its leaves in February and the flowers appear in March and April, at which time the ground beneath the trees is carefully cleared.

The flowers have a thick, juicy, globe-shaped corolla of a pale-cream color, inclosed at the base in a velvety chocolate-colored calyx. The corollas fall in the early hours of the morning and are collected by women and children. They are spread out to dry on mats in the sun, when they wither to half their weight and develop a brownish red color. In some cases the flowers are collected before they drop, and in many places it is the practice to remove only the corollas, leaving the pistil to ripen to a fruit. A tree will yield 200 to 300 pounds of flowers in a year.

When fresh, the flowers are extremely sweet, with a peculiar pungent flavor and a characteristic color. When dry, the peculiar pungent flavor is less perceptible, particularly if the stamens are removed, and the flavor then resembles that of figs. The flowers are eaten either fresh or dried and cooked in many different ways with rice, shredded coconut, or flour.

The greater portion of the crop of flowers is used for the preparation by fermentation of mowra spirit.

The corollas are very useful for feeding cattle; they have extraordinary keeping qualities, as they dry well and are not attacked by weevils.

The composition of the flowers has been investigated at different times and the results vary considerably, particularly in respect of the quantity and nature of the sugar present. The total proportion of sugar recorded in the flowers of this tree varies from 40 to 70 per cent. The quantity of cane sugar recorded varies from 3 to 17 per cent, and that of invert sugar from 40 to 53 per cent, while one author has stated that the sugar is entirely invert sugar. Only a small quantity of protein is present, the maximum record being 7.25 per cent.

The nuts contain a solid fleshy kernel, which includes from 35 to 40 per cent of greenish grease, obtained by pressure. The oil cake possesses a bitter taste and can not be used for cattle feeding. The butter becomes rancid soon after manufacture and becomes a dirty yellow color. Its density at 15° C. is 0.972; it melts at from 43° to 44° C. and solidifies at 36°. It is very soluble in ether and partially so in alcohol. It saponifies easily with alkalis, and it constitutes a mixture of 80 per cent stearin and 20 per cent oleine, with crystals of stearic acid. This oil is used to adulterate clarified butter and for soap and candle making.

During the war interest was centered in the production of acetone from these flowers in India to supply the local demand in connection with the manufacture of munitions. The acetone was produced by the now well-known special fermentation process, and it has been alleged that the yield from the flowers of *Bassia latifolia* was one-tenth of their weight, or nearly ten times as much as is obtainable by distilling wood. The demand for acetone in India in peace times would not be large enough to justify the available supplies of flowers being entirely devoted to the manufacture of that product, but there remains the possibility of their being used for the manufacture of industrial alcohol. The yield of alcohol from the flowers is high compared with that from potatoes and other materials commonly used. It has been stated that about 90 gallons of 95 per cent alcohol is obtainable from 1 ton of dried flowers.

In view of the extended use that is now being made of alcohol for power purposes, it seems likely that the most profitable way of utilizing the flowers would be as a source of a mixed motor spirit of the natalite type, for local use in India. That motor spirit can be produced on a manufacturing scale in

India from Bassia flowers has already been demonstrated, and it is stated that running trials with the spirit proved satisfactory.

The tree is well adapted to withstand drought and is especially suited for planting on dry and waste lands where little else will grow. The tree takes about 20 years to produce flowers and seeds in large quantity, but during this period the land need not be entirely unproductive if interplanting were adopted at first. (Adapted from *Daily Commerce Reports, No. 200, August 25, 1920, p. 952.*)

51156 and 51157.

From Tiflis, Transcaucasia, Russia. Seeds presented by Charles K. Moser, American consul. Received August 25, 1920. Quoted notes by Mr. Moser.

51156. CUCUMIS MELO L. Cucurbitaceæ. Muskmelon.

"The famous *duthma melon* from Armenian authorities at Erivan."

"A celebrated local variety of muskmelon said to be very fine." (*F. N. Meyer.*)

For previous introduction, see S. P. I. No. 27805.

51157. MEDICAGO SATIVA L. Fabaceæ. Alfalfa.

"*Lucern* from Armenian authorities at Erivan."

51158 to 51161.

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Gustav Helmrich. Received August 25, 1920. Quoted notes by Mr. Helmrich.

51158. AGROSTIS sp. Poaceæ. Grass.

"*Cok-pechadya* (small grass)."

51159. AXONOPUS sp. Poaceæ. Grass.

"Native name not obtainable."

51160. SPOROBOLUS INDICUS (L.) R. Br. Poaceæ. Grass.

A grass with erect culms up to 1 meter tall, in large clumps with numerous leafy shoots at the base; the panicle is 15 to 30 centimeters long, with slender, ascending branches, the short-pediceled spikelets mostly borne along the lower side. It often forms an almost pure stand on open slopes, and is an important constituent of native pastures. Found on grassy hills and dry savannas from the Bahamas and Mexico to northern South America. (Adapted from *Contributions from the National Herbarium, vol. 18, p. 369.*)

For previous introduction, see S. P. I. No. 48479.

51161. TRISETUM DEYEUXIOIDES (H. B. K.) Kunth. Poaceæ. Grass.

A fibrous-rooted grass with cespitose erect shining culms, glabrous nodes, and flat, linear, scabrous leaves. The branching panicle is whorled, often nodding, with lower branches spreading, upper appressed to the scabrous rachis. Native to the swamps along the bank of Lake Tezcuco, Mexico. (Adapted from *Bonpland and Humboldt, Nova Genera et Species Plantarum, vol. 1, p. 147.*)

51162 to 51179.

From Avondale, Auckland, New Zealand. Budwood presented by H. R. Wright, Avondale Nursery. Received August 31, 1920. Quoted notes by Mr. Wright.

51162 to 51179—Continued.

51162 and 51163. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

51162. "Dormant buds of *Allen's Late*."

51163. "Dormant buds of *Golden Queen* (improved)."

51164. MALUS PUMILA Mill. Malaceæ. **Paradise apple.**

"Blight-proof *Paradise* for use as a dwarfing stock; aphis resistant."

51165 to 51179. MALUS SYLVESTRIS Mill. Malaceæ. **Apple.**

51165. "*Aerial*, aphis resistant, used as a stock."

51166. "*Alpha*, aphis-resistant seedling from *Irish Peach*. The fruit is twice as large as the parent and much earlier. I consider it the earliest apple in existence. It is a gold mine to the fruit grower on account of its size, flavor, and extreme earliness; it is aphis proof and very productive. I predict a great demand for this apple as soon as I put it on the market, and when largely planted here, I think it will give the consignments of Canadian apples that arrive here in early summer a very nasty bump."

The parent, *Irish Peach*, is described in the Wright catalogue as "A medium-sized oblong fruit with clear yellow skin handsomely striped with bright red. The yellowish white flesh is tender and very juicy; the tree is a regular cropper and aphis proof."

51167. "*Ballarat*, a large cooking apple, and a great cropper; not aphis resistant, but well worth growing."

51168. "*Bordeaux Reinette*, a very fine dessert apple, and I believe aphis proof."

51169. "*Coles Champion*, a very late-keeping dessert apple; aphis resistant, and used as a stock."

51170. "*Cowell's Red Streak*, striped, midseason apple; aphis resistant, and used as a stock."

51171. "*Frimley Beauty*, a fair dessert apple and a good cooking apple, said to be *Rome Beauty* × *Jonathan* cross; not aphis resistant, but well worth growing."

51172. "*Imm's Seedling*, a large cooking apple; aphis resistant, and used as a stock."

51173. "*Irish Peach* seedling, for top-working *Pyrus prunifolia* as an intermediate stock for working any commercial variety that lacks affinity to *P. prunifolia* direct."

51174. "*Lippiatt's*, aphis resistant, used as stock."

51175. "*Lord Nelson*, a cooking apple of great size; a heavy cropper."

51176. "*Mobb's*, aphis resistant, used as a stock."

51177. "*Mobb's Royal*, a very large cooking apple; tree hardy and prolific."

51178. "*Motion's*, aphis resistant, used as a stock."

51179. "*Ruby Gem*, a beautiful apple of medium size, brilliant red all over; flesh snowy white, tender, crisp, juicy, mild, subacid, and delicious; strong grower and early bearer; blight proof; medium."

For previous introduction, see S. P. I. No. 6740.

51180 to 51182.

From Naples, Italy. Seeds presented by Willy Mueller, Hortus Partenopensis. Received September 14, 1920. Quoted notes by Mr. Mueller.

51180 and 51181. CITRULLUS VULGARIS Schrad. Cucurbitaceæ. Watermelon.

51180. "A white-seeded watermelon from Nocera; very good."

51181. "A black-seeded watermelon from Maddaloni, Province of Naples; extraordinarily good."

51182. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. Tomato.

"An extraordinarily large-fruited variety from Nocera."

51183. DACTYLIS ASCHERSONIANA Graebn. Poaceæ. Grass.

From Dahlem, near Berlin, Germany. Seeds presented by Dr. A. Engler, director, Royal Botanic Garden and Museum. Received September 3, 1920.

A creeping perennial grass, native to Germany, with runners up to 4 inches in length and lax stems up to 2 feet in height. The bright-green, rough leaves are lax, mostly narrow, sharp ribbed, and over a foot long. The panicles are about 8 inches long and pendent. (Adapted from *Notizblatt des Königlichen Botanischen Gartens zu Berlin, vol. 2, p. 274.*)

For previous introduction, see S. P. I. No. 30232.

51184 to 51190.

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received July 30, 1920. Quoted notes by Mr. Johnson.

51184. ARUNDINELLA DEPPEANA Nees. Poaceæ. Grass.

"(No. 329.) Grass collected above Quebradas Secas, 3,000 feet."

An erect, tufted perennial with strong slender simple culms up to 2.5 meters tall, with flat blades, scabrous at least on the upper surface, and rather densely flowered oblong panicles, 20 to 40 centimeters long. Native to moist places in Mexico and Brazil; also to central and western Cuba. (Adapted from *Contributions from the National Herbarium, vol. 18, p. 290.*)

51185 and 51186. CHAETOCHLOA SULCATA (Aubl.) Hitchc. Poaceæ. (*Setaria sulcata* Raddi.) Grass.

51185. "(No. 327.) Grass collected at an altitude of 3,000 feet along the roadside above Quebradas Secas."

A perennial grass cultivated in greenhouses or in the open in the Tropics for ornamental purposes, chiefly on account of the broad plaited blades, 2 inches wide, that resemble those of young palms. The dense, narrow panicles are 1 to 2 feet long. (Adapted from *Hitchcock, Genera of Grasses of the West Indies, p. 243.*)

For previous introduction, see S. P. I. No. 48776.

51186. "(No. 322.) A grass 2 feet tall, with reddish purple heads; collected along the roadside near Samac."

51187. ISACHNE ARUNDINACEA (Swartz) Griseb. Poaceæ. Grass.

"(No. 326.) A grass collected along the roadside above Quebradas Secas, at an altitude of 3,000 feet."

A grass which climbs among shrubs or small trees to a height of as much as 6 meters, with strong canes and elongated branches; the scabrous blades are commonly 20 centimeters long and 1.5 to 2 centimeters wide.

51184 to 51190—Continued.

The panicles are about 12 centimeters long, the long lower branches at first ascending, finally wide spreading; the spikelets are crowded toward the ends of the branches. Native to wooded hillsides in Jamaica at an altitude of 1,000 to 2,000 meters; also from Mexico to northern South America. (Adapted from *Contributions from the National Herbarium, vol. 18, p. 343.*)

For previous introduction, see S. P. I. No. 49447.

51188. PANICUM OLIVACEUM Hitchc. and Chase. Poaceæ. **Grass.**

"(No. 325.) Grass collected along the roadside above Quebradas Secas, at an altitude of 3,000 feet."

A grass with olive-green vernal culms, erect, or somewhat spreading at the base, 20 to 40 centimeters high, velvety villous with short hairs, and with bearded nodes. The blades are rather stiffly erect or ascending or some of the lower spreading, 4 to 7 centimeters long, 5 to 8 millimeters wide (the uppermost erect, 1 to 3 centimeters long), puberulent on both surfaces. The autumnal form is bushy with the branches evenly distributed. Native to gravelly banks and cultivated fields from Mexico to Costa Rica and also in Venezuela. (Adapted from *Contributions from the National Herbarium, vol. 15, p. 225.*)

51189. PASPALUM CONJUGATUM Berg. Poaceæ. **Grass.**

"(No. 279.) *Sac pachadya* (white meadow grass) from Chama, 6 to 12 inches high, rooting at the nodes. Very abundant in all places."

An extensively creeping perennial with compressed culms; the suberect flowering branches are sometimes 1 meter tall; the flat thin blades are up to 20 centimeters long and 8 millimeters wide; the spikelets bear long, scant, silky hairs around the margin. It is one of the commonest grasses of moist savannas and ditch banks, forming extensive and close mats. It is said by some to be an excellent forage grass. (Adapted from *Contributions from the National Herbarium, vol. 18, p. 318.*)

For previous introductions, see S. P. I. No. 38031.

51190. PASPALUM PANICULATUM L. Poaceæ. **Grass.**

"(No. 277.) *Rash tzimaaj* (green bow) from Chama. This is a tall-growing species reaching 2½ to 3 feet, with flower heads 7 feet long. It grows in clumps, stooling out in growing."

For previous introduction see S. P. I. No. 49379.

51191 to 51193.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received August 2, 1920.

51191. CAPPARIS MICRACANTHA DC. Capparidaceæ.

A large shrub or small tree with smooth bark, glabrous branches, and very small straight conic spines. The coriaceous, shining, broad-lanceolate leaves are 4 to 8 inches long, and the flowers, 2 to 4 in a series in vertical lines on the branches, are 1½ inches in diameter and have oblong petals 1 inch long. The smooth subglobose fruit is 2 to 3 inches long. (Adapted from *Hooker, Flora of British India, vol. 1, p. 179.*)

For previous introduction, see S. P. I. No. 43243.

51191 to 51193—Continued.

51192. IPOMOEA NYMPHAEAEFOLIA Blume. Convolvulaceæ.
(*I. peltata* Choisy.) Morning-glory.

"A white-flowered perennial species which should be of interest to your correspondents in Porto Rico, Cuba, and extreme southern Florida. The plant is of medium growth and blossoms during the winter months, the tourist season." (*Wester.*)

For previous introduction, see S. P. I. No. 47920.

51193. TALINUM PATENS (L.) Willd. Portulacaceæ.

"An upright-growing perennial herb from Java, with tender, succulent leaves absolutely free from fiber. The leaves are boiled and eaten with meat, fish, or eggs, like spinach or turnip greens, and make an excellent dish for the table.

"The seeds should be sown very shallow, where they are well protected from heavy rains, as the young plants are very delicate. As soon as the plants are 15 centimeters high they can be cut off a few centimeters above the ground, where they rapidly take root. Once the Talinum plants are through the seedling stage they grow very rapidly and are easily multiplied from cuttings 10 to 12 centimeters long, both from the tender tops and the mature stems. In the vegetable garden plants should be set out above 25 centimeters apart, in rows 30 to 35 centimeters apart." (*Wester.*)

51194. BISCHOFIA TRIFOLIATA (Roxb.) Hook. Euphorbiaceæ.
(*B. javanica* Blume.)

From Buitenzorg, Java. Seeds presented by Dr. J. C. Koningsberger, director, Botanic Gardens. Received August 5, 1920.

A deciduous tree native to the tropical slopes of the Himalayas. The red, rough, moderately hard wood is esteemed one of the best timbers in Assam, where it is used for bridges and other works of construction. It is sometimes called "red cedar." (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 454.*)

For previous introduction, see S. P. I. No. 47835.

51195 to 51197.

From Chama, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received August 23, 1920. Quoted notes by Mr. Johnson.

51195. ACHIMENES sp. Gesneriaceæ.

"(No. 435.) A fine gesneriad with sky-blue flowers, borne in terminal racemes of 3 to 22 or more, about 1 inch in diameter and with a white and yellow throat. The plant produces small round scaly tubers and should make a good basket plant."

51196. COIX LACRYMA-JOBI L. Poaceæ. Job's-tears.

"(No. 171.) *K-ohl.* The Indians prize the seeds for necklaces. *K-ohl* means necklace, in Kekchi."

For previous introduction, see S. P. I. No. 49516.

51197. ISACHNE ARUNDINACEA (Swartz) Griseb. Poaceæ. Grass.

"(No. 434.) Grass."

A grass climbing among shrubs or small trees to a height of as much as 6 meters, with strong canes and elongate branches; the scabrous blades are commonly 20 centimeters long and 1.5 to 2 centimeters wide;

51195 to 51197—Continued.

the panicles are 12 centimeters long, the long lower branches at first ascending, finally wide spreading; the spikelets are crowded toward the ends of the branches. Native to wooded hillsides of Jamaica, and from Mexico to northern South America at altitudes of 1,000 to 2,000 feet. (Adapted from *Contributions from National Herbarium, vol. 18, p. 348.*)

For previous introduction, see S. P. I. No. 49447.

51198. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

From Santiago, Chile. Seeds presented by Salvador Izquierdo. Received August 27, 1920.

The Chilean bean, as this most interesting variety is called, is a climber with whitish flowers and pods which become purple at maturity; each pod contains 5 to 7 almost globular, chamois-colored seeds. The foliage is equally abundant at flowering and fruiting time. During rainy periods this plant matures with no signs of mold or rot. The seeds are sown May 10, and are harvested the latter part of September.

When green, this variety makes an excellent dish; the ripe seeds dried are especially good in meat stews and soups. The seed is very starchy; it cooks well without splitting, and the seed coat is much more digestible than that of the Soissons bean and similar varieties. (Adapted from *Bulletin de la Société Nationale d'Acclimatation de France, vol. 65, p. 350.*)

51199. AVENA SATIVA L. Poaceæ. **Oats.**

From Cadiz, Spain. Seeds presented by B. Harvey Carroll, American consul. Received August 27, 1920.

"The only cultivated variety of Spanish-grown oats on sale in the market of Cadiz; on account of its isolated position, Cadiz is not the best market for agricultural products, and no new varieties have been produced in recent years." (*Carroll.*)

51200. GARCINIA MANGOSTANA L. Clusiaceæ. **Mangosteen.**

From Peradeniya, Ceylon. Seeds presented by C. Drieberg, secretary, Ceylon Agricultural Society. Received August 30, 1920.

"The mangosteen is renowned as one of the delicious fruits of the world and has been called the 'queen of tropical fruits.' The tree is strictly tropical and can be successfully grown only under the most favorable soil and climatic conditions." (*R. A. Young.*)

For previous introduction, see S. P. I. No. 49441.

51201. EUGENIA CURRANII C. B. Robinson. Myrtaceæ.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received September 1, 1920.

A very attractive Philippine tree attaining a height of 9 meters or more, with gnarled trunk and tortuous branches and quadrangulate-winged young growth. The oblong-ovate, entire, leathery leaves are dark green and shining; the fruit is congregated 20 to 50 in clusters on the bare branches or between the leaves on the more mature twigs; the individual fruit is about the size of a grape with a thin, smooth, dark-red skin which changes to black at full maturity. The flesh is red near the skin, otherwise white, rather dry and crisp, and pro-

nouncedly acid with a pleasant flavor not unlike that of the crab apple. The relatively large seed which clings to the flesh is sometimes absent. The fruit is too acid for use as a dessert but would, in all probability, make an excellent jelly. The fruit is used in some localities for making preserves, wine, and pickles.

The tree is of vigorous growth, succeeds well where the wet and dry seasons are strongly accentuated, and requires well-drained land for the best results. In productiveness it is apparently exceeded by no other species in the genus, and it ripens principally from April to June. (Adapted from *Philippine Agricultural Review, vol. 8, p. 105.*)

For previous introduction, see S. P. I. No. 38375.

51202 and 51203.

From Seville, Spain. Seeds presented by Robert Harnden, American consul. Received September 3, 1920. Quoted notes by Mr. Harnden.

51202. AVENA SATIVA L. Poaceæ. **Oats.**

"*Gray* oats, one of the only two kinds grown in Andalusia."

"Apparently similar to *Winter Turf* (*Gray Winter*)." (*C. W. Warburton.*)

51203. AVENA STERILIS L. Poaceæ. **Oats.**

"*Fair* oats, one of the only two kinds grown in Andalusia."

51204. PACHIRA FASTUOSA (DC.) Decaisne. Bombacaceæ.

(*P. macrocarpa* Walp.)

From Santiago de las Vegas, Cuba. Seedlings presented by Gonzalo M. Fortun, director, Agricultural Experiment Station. Received September 4, 1920.

Seedlings of a handsome tropical tree, native to Mexico. The flowers in their size and color are both exceptional and attractive, as they measure about a foot in diameter; the strap-shaped petals are white, and the large brushlike cluster of stamens crimson and yellow. The foliage is not unlike that of the horse-chestnut, but it is more leathery in texture. (Adapted from *Gardeners' Chronicle, vol. 54, p. 325.*)

51205. PASSIFLORA MOLLISSIMA (H. B. K.) Bailey. Passifloraceæ.

From Guayaquil, Ecuador. Seeds presented by James Birch Rorer, Asociación de Agricultores del Ecuador. Received September 9, 1920.

"Seeds of a fruit which is grown in the valleys of the Sierra and which is commonly called 'tacso.' The flavor of the fruit is somewhat like that of currants. A very delicious sherbet or ice cream can be made from it and also a fine drink or 'refresco.'" (*Rorer.*)

51206 and 51207.

From Buitenzorg, Java. Bulbs presented by Dr. P. J. S. Cramer, chief, Plant-Breeding Station. Received September 9, 1920.

51206. AGAVE CANTALA (Haw.) Roxb. Amaryllidaceæ.

A species long grown in the Philippine Islands for "maguey fiber," probably originally introduced from Mexico. The short, thick stem bears an aloelike cluster of large fleshy leaves and a tall flower stalk, on which grow a large number of small bulbils or "pole plants." The spiny-edged leaves are grouped compactly around the stem and terminate in a hard, sharp spine. The plant lives from 7 to 25 years and does

51206 and 51207—Continued.

not flower until it is 7 or 8 years old, hence the belief that it flowers only once every century and the popular name "century plant."

A long dry season and a light rainy one are essential for the best growth of this plant; while warm, clear, dry weather, with bright sunshine, is required to dry and bleach the fiber. The thick and pulpy leaves of the maguey render it capable of withstanding long droughts which would be disastrous to most other economic plants. The most essential step in maguey cultivation is the selection of a well-drained soil. Shallow, rocky, limestone soils and soils formed by the disintegration of coral rock are best suited for maguey growing.

The fiber is large, inflexible, slightly yellowish, and of a great tenacity. This latter quality renders it very valuable in all cases where sudden strains are anticipated, while its lack of elasticity prevents it from being used to advantage in power transmission. In the United States it is largely used for the manufacture of binder twine, fodder yarns, and various other cordage purposes. In the Philippine Islands carefully selected young leaves are cleaned by the same process used in cleaning pineapple leaves; the fiber thus obtained is very fine and silky and is used for making cloth, fine handkerchiefs, and other articles. (Adapted from *Philippine Agricultural Review, vol. 3, p. 424.*)

For previous introduction, see S. P. I. No. 33508.

51207. CROTALARIA USARAMOENSIS Baker f. Fabaceæ.

A tall herb, native to German East Africa and allied to *C. lanceolata* E. Mey. from which it differs in its broader and shorter leaflets, which are glabrous above and strigose pubescent below. The racemes are 15 to 25 centimeters long.

In Buitenzorg the grayish fiber is not so smooth and silky as that of *Hibiscus cannabinus*, but that does not necessarily mean that it is not suitable for the spinning of yarn. The same is the case with sunn hemp (*Crotalaria juncea*), which in British India is more highly esteemed than Deccan hemp (*Hibiscus cannabinus*). A great drawback is that the total quantity of fiber obtained up to the present differs very materially in strength and ordinarily is not very strong. How this will be influenced by different climatic and cultural conditions and soil can be determined only by making tests elsewhere, which is strongly recommended.

The practical utility of the fiber can be determined only by spinning and weaving tests. Adequate specimens are available for these tests, but unfortunately tests can not be carried out on account of the difficulty in exporting.

The leaves are used as a green manure and as cattle feed. Analyses made by Dr. A. W. K. de Jong, of the Agricultural Chemical Laboratory, give the following percentages for fresh and dry leaves, respectively: Albumin, 5.3 and 26.7; nitrogen, 0.87 and 4.27; fat, 1.4 and 7.0; starch 1.9 and 9.6; crude fiber, 4.0 and 20.1; crude ash, 0.9 and 4.5. The water content of the fresh leaves was 80.1 per cent and their nutritive value 34.4 per cent.

The roots and stems will perhaps be suitable for the manufacture of paper, where the transportation facilities are favorable. The wood which remains after the removal of the fiber is very thin and smooth, but burns well and without smoke and is much in demand by the inland

51206 and 51207—Continued.

women as firewood. It has no commercial value, but is very acceptable in regions where firewood is scarce.

The seed from an old planting is very plentiful; from a planting harvested solely for fiber there are perhaps enough seeds for a new planting. Whether from the seeds a profitable by-product can be made has not yet been demonstrated. Probably they are good chicken feed. An analysis of the seeds shows the following percentages: Water, 12.9; oil, 2.98; albumin, 23.5; nitrogen, 3.72.

In the neighborhood of a Crotalaria plantation bees multiply rapidly and produce very good honey. (Adapted from *Journal of the Linnean Society, vol. 42, p. 346,* and *Buitenzorg, Mededeelingen uit den Cultuurtuin No. 12, 1918.*)

51208. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

From Orange, Calif. Seeds presented by C. P. Taft. Received September 11, 1920.

"Seedling avocados, first generation from plants grown from the Chilean seed you gave me. They resemble very closely the fruit of the original tree and are as hardy as any. I find that I have several trees of the type." (*Taft.*)

51209 to 51211.

From Haifa, Syria. Seeds collected by Amram Khazanoff, Jewish Colonization Association. Received September 14, 1920. Quoted notes by Mr. Khazanoff.

"These grains have recently been introduced into our colonies west of the Jordan and are giving good results there. Collected at Ayelette Hashahar (i. e., Morning Star), near the Waters of Merom, Syria."

51209. HORDEUM VULGARE COELESTE L. Poaceæ. **Barley.**

"*Nebawi* barley, glumeless, from the Mountain of Nebo in the Land of Moab, whence its name."

51210 and 51211. TRITICUM DURUM Desf. Poaceæ. **Durum wheat.**

51210. "*Mahmoodi* wheat, of Tunisian origin, best adapted for heavy moist soils."

51211. "*Reyati* wheat, from Lebanon, where it does very well."

51212 and 51213.

From Melbourne, Victoria. Seeds purchased from F. H. Brunning, Pty. Ltd. Received August 19, 1920.

51212. TRIFOLIUM SUBTERRANEUM L. Fabaceæ. **Clover.**

An annual clover, native to the Mediterranean countries, with prostrate stems up to a foot in length and long-petioled leaves. The fertile flowers are borne in clusters of two to seven, and the infertile flowers are very numerous. The petals are white, marked with pink. This clover is usually found in cultivated places, especially in sandy locations. (Adapted from *Ascherson und Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, p. 596.*)

For previous introduction, see S. P. I. No. 38983.

51212 and 51213—Continued.

51213. LOLIUM PERENNE L. Poaceæ. **Wimmera rye-grass.**

"A tufted short-lived perennial which makes a fair crop of hay and is especially valuable in pastures. It usually grows to a height of 1 to 2 feet, and produces an abundance of long, narrow leaves near the base of the plant. This has been a popular grass in England for at least three centuries and was early introduced into America.

"The chief uses to which this grass should be put are as an ingredient in pasture mixtures, as a temporary covering to prevent the washing of the soil, for lawns, and for winter grazing on Bermuda grass pastures in the South. It is valuable for these purposes because of its rapid germination and growth. It should have a fertile, moist soil with a cool, damp climate." (*Lyman Carrier.*)

For previous introduction, see S. P. I. No. 36099.

51214. CHENOPODIUM ALBUM L. Chenopodiaceæ.

From Calcutta, India. Seeds presented by H. G. Carter, director, Botanical Survey of India. Received July 3, 1920.

"The plant grows to the height of 6 feet, and the seeds ripen in October. When young the leaves and tender branches are gathered as a potherb, much resembling spinach, and are regarded as very wholesome; but the plant is chiefly valued for its seeds, which are used as a cereal. The seed is said to be superior to buckwheat and rich in certain salts. The hill tribes of certain parts of the western Himalayas cultivate Chenopodium as one of the principal crops." (*Carter.*)

51215. CITRUS SINENSIS (L.) Osbeck. Rutaceæ. **Orange.**

From Jerusalem, Palestine. Budwood presented by J. Ettinger, director, Agriculture and Colonization Department, Zionist Commission. Received August 2, 1920.

"Bud sticks of the Jaffa orange, *Shamooti.*" (*Ettinger.*)

The Jaffa orange is one of the largest, larger even than the Washington Navel. Its form is obovate, its skin very thick, and its fruit seedless. The tree is not spiny, and the fruit, therefore, is never scarred by thorns. Its shipping qualities are excellent.

The Jaffa oranges seen in Tunis and Algeria and those grown in America and illustrated in American publications have very little resemblance to the real Jaffa orange. They are represented as having seeds, while the true Jaffa orange is seedless. (Adapted from *Aaronsohn, Agricultural and Botanical Explorations in Palestine, p. 26.*)

For previous introduction, see S. P. I. No. 37461.

51216 to 51248.

From Kenia. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received July 30, 1920. Quoted notes by Doctor Shantz.

51216. ABUTILON sp. Malvaceæ.

"(No. 974. Voi, Seyidie Province, Kenia. April 19, 1920.) A very attractive yellow-flowered mallow; flowers 1 inch in diameter."

51216 to 51248—Continued.

51217. ANNONA CHERIMOLA Mill. Annonaceæ. **Cherimoya.**

"(No. 958. Moshi, Tanganyika Territory. April 15, 1920.) An anona with a large heart-shaped fruit 8 inches long, not unlike the soursop, and of excellent flavor."

51218. CALOPHYLLUM INOPHYLLUM L. Clusiaceæ.

"(No. 950. Zanzibar, Zanzibar. April 7, 1920.) A large tree, with a leaf like that of a magnolia or Ficus, and bearing a fruit about 1 inch in diameter, the pulp of which is often eaten by natives."

51219. CASSIA LAEVIGATA Willd. Cæsalpiniaceæ.

"(No. 975. Embu, Kenia Province, Kenia. May 3, 1920. Herb. No. 800.) A small cassia extensively used as a hedge and ornamental in this section. It appears everywhere and behaves as a wild plant. It is exceptionally useful, and will stand a cool climate but may not withstand frost. The climate here is very cool, but frost does not occur. Try it out in Florida and California, but if it will stand frost, it will do well over a much wider range."

51220. CASSIA OCCIDENTALIS L. Cæsalpiniaceæ.

"(No. 973. Voi, Seyidie Province, Kenia. April 19, 1920.) A yellow legume, similar in habit to Glycyrrhiza."

For previous introduction, see S. P. I. No. 42830.

51221. CUCUMIS sp. Cucurbitaceæ. **Cucumber.**

"(No. 971. Voi, Seyidie Province, Kenia. April 19, 1920.) A warty cucumber, 2 to 2½ inches long, which when ripe is eaten by animals."

51222. CUCUMIS ANGURIA L. Cucurbitaceæ. **Cucumber.**

"(No. 960. Moshi, Tanganyika Territory. April 15, 1920.) A rough-fruited cucumber, probably not used as food."

For previous introduction, see S. P. I. No. 46893.

51223. CYPHOMANDRA BETACEA (Cav.) Sendt. Solanaceæ. **Tree-tomato.**

"(No. 970. Moshi, Tanganyika Territory. April 17, 1920.) Brazilian tree-tomato."

For previous introduction, see S. P. I. No. 44913.

51224. DIOSCOREA sp. Dioscoreaceæ. **Yam.**

"(No. 965. Moshi, Tanganyika Territory. April 16, 1920.) Growing in a native garden. I have noticed only one of these plants. A very luxuriant growth with aerial tubers very numerous."

51225. GLADIOLUS sp. Iridaceæ. **Gladiolus.**

"(No. 964. Moshi, Tanganyika Territory. April 16, 1920. Herb. No. 795.) A plant with irislike leaves and very attractive white flowers."

51226. HETEROPOGON CONTORTUS (L.) Beauv. Poaceæ. **Grass.**

"(No. 982. Nairobi, Ukamba Province, Kenia. May 15, 1920.) The dominant grass of the Ati Plains, an excellent forage grass which produces seed readily and is perennial. Its habit is somewhat like that of *Andropogon scoparius* in the eastern portion of its range. This is one of the most important African grasses and should be given a thorough test in the highlands of California, Arizona, and New Mexico and in the pinelands of the South, especially in Florida."

For previous introduction, see S. P. I. No. 15357.

51216 to 51248—Continued.

51227. HIBISCUS sp. Malvaceæ.

" (No. 983. Nairobi, Ukamba Province, Kenia. May 25, 1920.) A very attractive flower about three-fourths of an inch in diameter."

51228. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

" (No. 952. About 50 miles above Tanga, Tanganyika Territory. April 7, 1920.) An especially interesting form, differing in habit from all others seen here."

51229. HORDEUM VULGARE COELESTE L. Poaceæ. **Naked barley.**

" (No. 963. Moshi, Tanganyika Territory. April 16, 1920.) Hull-less barley, said to grow much better than wheat; a local crop. Small grains suffer from rust chiefly and a rust-resistant variety is essential."

51230. LUFFA ACUTANGULA (L.) Roxb. Cucurbitaceæ. **Loofah gourd.**

" (No. 967. Moshi, Tanganyika Territory. April 17, 1920.) A very large long type with outstanding ribs on the fruit. Seems distinct from other types seen here."

For previous introduction, see S. P. I. No. 42069.

51231. MUSA ENSETE Gmel. Musaceæ.

" (No. 976. En route from Embu to Meru, Kenia Province, Kenia. May 3, 1920.) A beautiful ornamental which grows along mountain streams; not eaten by natives here, although the large starchy seeds are occasionally seen in bead strings and as charms. The leaves are long, upright, and beautifully colored; they are used as skirts by the Kukuyu women, and also to tie up bundles. There are about a dozen seeds in each banana, and the natives say, 'Banana fruit poison.' The plant should grow wherever frost does not occur too frequently."

For previous introduction, see S. P. I. No. 35236.

51232. NICOTIANA TABACUM L. Solanaceæ. **Tobacco.**

" (No. 966. Moshi, Tanganyika Territory. April 16, 1920.) The type grown by the natives and sold in powdered form, a small banana-leaf package to each person. The women usually sell the tobacco in the markets."

51233. ORYZA SATIVA L. Poaceæ. **Rice.**

" (No. 954. Moshi, Tanganyika Territory. April 12, 1920.) Grown as a dry-land crop on dark, rich soil previously supporting a splendid high forest. Only a few heads are ripe at this time."

51234. GLORIOSA SIMPLEX L. Melanthaceæ.

"(No. 984. En route from Embu to Muzambi, Kenia Province, Kenia Colony. May 20, 1920.)" A showy plant somewhat similar to *Gloriosa superba* and producing a profusion of flowers with stalked reflexed spreading segments 2 inches long, yellow at the base, red on the outside, and recurved at the points. The flowers are one-third smaller than those of the common Gloriosa, asd the segments are nearly oval, entire, acuminate, and scarcely undulated except toward the point. The leaves resemble those of the common Gloriosa and are in like manner terminated by a tendril. (Adapted from *Curtis's Botanical Magazine, pl. 5239;* and *Gardening Illustrated, vol. 26, p. 556.*)

51216 to 51248—Continued.

51235. PTEROCARPUS INDICUS Willd. Fabaceæ.

"(No. 951. Zanzibar, Zanzibar. April 7, 1920.) A tree with a seed similar to that of Burkea. Useful as an ornamental."

51236 to 51238. RICINUS COMMUNIS L. Euphorbiaceæ. Castor-bean.

51236. "(No. 972. Voi, Seyidie Province, Kenia. April 19, 1920.) Castor-bean."

51237. "(No. 977. En route from Meru to Embu, Kenia Province, Kenia. May 3, 1920.) A large-seeded reddish type, which grows into treelike plants in the high, cool, mountainous country. This crop is used chiefly for external decoration; the oil is extracted by boiling, mixed with red clay, and this worked into the hair and smeared over the body of both men and women."

51238. "(No. 978. En route from Meru to Embu, Kenia Province, Kenia. May 3, 1920.) Large, and similar to No. 977 [S. P. I. No. 51237], but lighter in color."

51239. COLEUS BARBATUS (Andrews) Benth. Menthaceæ.

"(No. 979. En route from Thika to Embu, Kenia Province, Kenia. May 8, 1920.) A salvia or mint, forming a beautiful blue shrub or half shrub. It has a rather fleshy base and is probably propagated by cuttings, but it grows wild everywhere in this section. It forms a beautiful hedge, a mass of sky-blue flowers above the foliage. The natives have made hedges of it in many places."

51240. THUNBERGIA GIBSONI S. Moore. Acanthaceæ.

"(No. 981. Nairobi, Ukamba Province, Kenia. May 15, 1920. Herb. No. 828.) A very attractive low-growing vine with profuse orange-colored trumpet flowers. Very abundant in high forest regions of British East Africa."

51241 and 51242. TRITICUM AESTIVUM L. Poaceæ. Common wheat. (*T. vulgare* Vill.)

51241. "(No. 961. Moshi, Tanganyika Territory April 16, 1920.) Wheat grown on the slopes of Mount Kilimanjaro."

51242. "(No. 962. Moshi, Tanganyika Territory. April 16, 1920.) Wheat grown on the slopes of Mount Kilimanjaro."

51243. VIGNA sp. Fabaceæ.

"(No. 956. Moshi, Tanganyika Territory. April 15, 1920. Herb. No. 793.) A small wild pea with a long and slender pod. The vine grows over low bushes."

51244. ZEA MAYS L. Poaceæ. Corn.

"(No. 953. Moshi, Tanganyika Territory. April 12, 1920.) Corn collected in a native field. Corn is a crop of first importance here. All stages of development were seen, planting and harvesting at the same time."

51245. (Undetermined.)

"(No. 955. Moshi, Tanganyika Territory. April 15, 1920. Herb. No. 794.) A small bean said by the natives to be good food. Only 2 seeds in each pod. The plant is abundant in the brush or second-growth areas about Moshi."

51216 to 51248—Continued.

51246. (Undetermined.)

"(No. 968. Moshi, Tanganyika Territory. April 17, 1920.) A small cucumber, reddish yellow when ripe, 1 inch in diameter and 2 to 2½ inches long. This fruit has a very strong taste, but others which look like this are very good to eat."

51247. (Undetermined.)

"(No. 969. Moshi, Tanganyika Territory. April 17, 1920.) Similar to No. 968 [S. P. I. No. 51246] but with pale markings."

51248. (Undetermined.)

"(No. 980. Nairobi, Ukamba Province, Kenia. May 15, 1920. Herb. No. 839.) A very beautiful low, well-rounded, mound-shaped shrub with nearly white bell-shaped flowers in graceful clusters, which should prove an attractive ornamental. It looks like one of the mallow fiber plants; its bast fiber is very good."

51249 to 51251.

From Pernambuco, Brazil. Seeds presented by Hugh Matheson, through I. P. Roosa, New York. Received September 14, 1920. Quoted notes by Mr. Matheson.

51249. ANACARDIUM OCCIDENTALE L. Anacardiaceæ. **Cashew.**

"*Caju.* A West Indian tree, 30 to 40 feet in height, with large leathery leaves and small kidney-shaped nuts borne on swollen pea-shaped stalks 2 to 4 inches long. Its juicy, acidulous stalk is used in preserves and the edible seed is roasted and served as a dessert."

For previous introduction, see S. P. I. No. 45095.

51250. CARICA sp. Papayaceæ. **Papaya.**

"*Mamão Caranus.*"

51251. (Undetermined.)

"*Mangabas.*"

51252. FICUS sp. Moraceæ. **Fig.**

From Pernambuco, Brazil. Plants presented by Hugh Matheson, through I. P. Roosa, New York, N. Y. Received September 24, 1920.

A Brazilian tree of possible value as a shade or avenue tree in southern Florida.

51253. MEZONEURUM SCORTECHINII F. Muell. Cæsalpiniaceæ.

From Burringbar, New South Wales, Australia. Seeds presented by B. Harrison. Received September 16, 1920.

"A vine or trailing shrub called *barisber*, which would make a first-class hedge if trained on a wire fence. It is a strong, thick, prickly vine with splendid fern-like foliage and large racemes of bright-yellow flowers." (*Harrison.*)

51254. OLNEYA TESOTA A. Gray. Fabaceæ.

From Coachella, Calif. Seeds presented by William R. Faries. Received September 14, 1920.

A handsome flowering tree, with wood that is dark, heavy, and hard, like ebony, and with nutritious foliage and flowers that are eaten with avidity by animals. The tree bears heavy crops of pods not unlike those of garden beans, and each pod may have several seeds of the size, appearance, and texture of

small peanuts and having the same agreeable flavor when roasted. The fleshy young pods probably could be cooked and eaten like green beans, since they do not taste bitter, even in the raw state. The largest pods have nine fully developed and two abortive beans.

The Olneya is the largest as well as the most attractive native tree in the driest deserts of the Southwest, away from the stream beds and with full exposure to heat and drought. The large taproot remains entirely unbranched for 7 or 8 feet. Such a habit of growth would indicate little or no interference with surface crops and would suggest the value of the tree for planting in or near cultivated lands where it may serve very well for hedges or windbreaks, as well as for holding terraces or as barriers against erosion. Even on desert lands that are too broken for irrigation it might prove worth while to plant belts of Olneya across the washes, to hold back and spread the flood waters. More moisture would be absorbed by the soil, and more vegetation could grow in addition to the forage that the Olneya itself would afford. (Adapted from *O. F. Cook, Journal of Heredity, vol. 10, p. 321.*)

For previous introduction, see S. P. I. No. 4537.

51255 and 51256.

From Alexandria, Egypt. Seeds presented by Prof. S. C. Mason, arboriculturist, United States Department of Agriculture. Received September 21, 1920.

51255. ALLIUM CEPA L. Liliaceæ. **Onion.**

A variety cultivated near Alexandria that may be useful for breeding work.

51256. CUCUMIS MELO L. Cucurbitaceæ. **Muskmelon.**

"*Aggur* muskmelon." (*Mason.*)

51257. DIGITARIA IBURUA Stapf. Poaceæ. Grass.

From Kaduna, Nigeria. Seeds presented by P. H. Lamb, director of Agriculture, Northern Provinces. Received August 24, 1920.

"*Iburu* is grown by the natives of Northern Nigeria as a cereal. The grains separate fairly readily from the husks when pressure is applied, and the seeds are pure white. They weigh in their husks on the average 0.7 mgr., so that over 40,000 go to one ounce. As one raceme may contain as many as 200 spikelets, a single head may yield between 1,000 and 2,000 grains." (*Kew Bulletin of Miscellaneous Information, No. 8, 1915, p. 381.*)

"Introduced for testing as a forage crop." (*Piper.*)

51258 to 51265.

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received September 15, 1920. Quoted notes by Mr. Johnson.

51258. DESMONCUS sp. Phœnicaceæ. **Palm.**

"(No. 585.) A very spiny ornamental vine climbing, by hooks at the tip of the rachis, to the tops of forest trees."

51259. PANICUM MILLEGRANA Poir. Poaceæ. **Grass.**

"(No. 438.) From Chipok, Coban. A creeping grass, rooting at the nodes, growing luxuriantly on clay banks."

51260. PANICUM FASCICULATUM Swartz. Poaceæ. **Grass.**

"(No. 496.) Grass from Chama. More or less stooling in habit: leaves rather sparse."

51258 to 51265—Continued.

51261. PASPALUM DENTICULATUM Trin. Poaceæ. **Grass.**

"(No. 439.) A coarse, tall, cattaillike grass, 4 to 5 feet tall, always found growing in wet places. From Chipok, Coban."

51262. PASPALUM NOTATUM Fluegge. Poaceæ. **Grass.**

"(No. 441.) A grass, 6 to 12 inches tall, which forms a close mat. Grows in potiero, where it does well. From Chipok, Coban."

51263. PASPALUM PLICATULUM Michx. Poaceæ. **Grass.**

"(No. 440.) A grass, 2 to 4 feet tall, from Chipok, Coban. Seeds taken from a haystack of which this grass formed a large part."

51264. PIPER sp. Piperaceæ.

"*Cordoncilla.*"

For previous introduction, see S. P. I. No. 51059.

51265. SOLANUM sp. Solanaceæ.

"(No. 586.) *Macui*, in Kekchi dialect. Similar in habit and appearance to *Solanum douglasii* of California, but more shrubby. The tender young tips, picked and sorted and the tougher stems discarded, are widely used throughout this region as greens. During the hot summer season vegetables become scarce, but the *macui* is always to be had. The *macui* greens have an excellent flavor, are said to have medicinal properties, and seem to have more body than others. They are sometimes fried with eggs stirred in."

51266 and 51267. MYRCIARIA CAULIFLORA (Mart.) Berg. Myrtaceæ. **Jaboticaba.**

From Deodoro, Federal District, Brazil. Seeds presented by Dr. Aristides Caire, Campo Experimental. Received September 21, 1920.

51266. "A remarkably interesting tree with a compact symmetrical head of small bright-green leaves. The jaboticaba grows wild in southeastern Brazil, and is also cultivated to a greater extent than almost any other native fruit. The delicious fruits, abundantly produced directly upon the bark of the tree, are round, half an inch to 1½ inches in diameter, with thick, glossy, maroon-purple skin and translucent juicy white or rose-tinged pulp, of a most agreeable, vinous flavor. The oval compressed seeds, one to four to a fruit, are about half an inch long. The tree comes into bearing when 6 to 8 years old, and withstands little frost." (*P. H. Dorsett.*)

For previous introduction, see S. P. I. No. 45750.

51267. "*Jaboticaba murta mineira.* This variety is very good, with a fine skin, and very succulent. It is mostly cultivated in Rio de Janeiro, Minas Geraes, and Sao Paulo." (*Caire.*)

51268. HIBISCUS SABDARIFFA L. Malvaceæ. **Roselle.**

From Formosa, Argentina. Seeds presented by A. Wetmore, Biological Survey, United States Department of Agriculture. Received September 15, 1920.

An Old World tropical annual, 5 to 7 feet high, with almost sessile yellow flowers, each with a red eye, which open only one day. In three weeks the fleshy reddish calyxes are ready for the making of an unexcelled jelly. Each plant averages a yield of 2 pounds of calyxes.

Roselle sauce makes an excellent substitute for cranberry sauce. Analysis (by the Food Laboratory of the Bureau of Chemistry) of the calyx of roselle and the fruit of the cranberry show striking resemblances between them, the respective percentages being as follows: Water, 88.91 and 88.53; solids, 11.09 and 11.47; ash, 0.89 and 0.25; marc (insoluble matter), 6.67 and 4.60; acid (as malic), 2.77 and 2.74; reducing sugar (as invert), 0.33 and 1.90; sucrose, 0.03 and 0.10. Benzoic acid is absent in the roselle calyx and present in the cranberry fruit. Starch is absent in the roselle calyx.

Weight of fruit of roselle, 6.11 grams; cranberry, 0.94 grams. Percentage of edible portion: Roselle, consisting of calyx minus portion of its base which is cut away in removing the seed pods, 50.22; cranberry, 100.

The young roselle stems also make good jelly, and for such use the plants can be grown almost anywhere in the North or South. Roselle is grown in India for its fiber, which is used in the manufacture of cordage and coarser textile products, and could be cultivated for this purpose in the southern United States. For fiber the crop is cut while in flower, dried, made into bundles, and soaked in water for 15 or 20 days. It is then possible to wash out a strong silky fiber known as roselle hemp, considered by some to be the equal of jute. The leaves are sometimes used as a salad, and the seeds are supposed to have medicinal properties. They are also fed to cattle and poultry. (Adapted from *United States Department of Agriculture, Farmers' Bulletin 307.*)

For previous introduction, see S. P. I. No. 47119.

51269 to 51279. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Copenhagen, Denmark. Seeds presented by Axel Lange, curator, Botanic Garden. Received September 24, 1920. Quoted notes by Mr. Lange.

Introduced for experimental work by the Office of Forage-Crop Investigations.

51269. "Native, from Lystrup Skov."

51270. "Locally grown, from Dansk Kvarter."

51271. "Locally grown, from Stranghojgaard."

51272. "Native, from Lystrup Skov."

51273. "Locally grown, from Koge."

51274. "Native, from Mose s. p., for Lystrup Skov."

51275. "Locally grown, from Biologisk Kvarter."

51276. "Locally grown, from Undervisiningskvarter."

51277. "Locally grown, from Farum."

51278. "Locally grown from Farum Bregnersd."

51279. "Locally grown, from Amazir."

51280. SOLANUM HAEMATOCLADUM Dunal. Solanaceæ.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received September 20, 1920.

"An ornamental shrub with rather beautiful grayish blue flowers and blood-red fruits, growing dense and to a height of about 2 meters; it is quite hardy here. Native to Bolivia." (*Proschowsky.*)

51281. CANAVALI sp. Fabaceæ.

From Bahia, Brazil. Seeds presented by Dr. V. A. Argollo Ferrão. Received September 21, 1920.

"A wild bean that grows in the coconut plantations along the seacoast. The beans are found where the sands are fertile and receive subterranean irriga-

tion from the fresh-water lagoons whose water must run to the sea, by filtering beneath the sandy coast soil. These beans have very persistent vegetative parts and may be good pasture. On the place where I found these seeds mules and donkeys were feeding. The plant may be very useful for pasture and green manure for salt lands, for it grows quite close to the seaside." (*Argollo Ferrão.*)

51282 and 51283.

From Blackwood, South Australia. Seeds presented by E. Ashby. Received September 21, 1920. Quoted notes by Mr. Ashby.

"Seeds of these species were collected on Kangaroo Island in 1909 and grown in the wild part of my place, 'Wittunga,' where they have done well amongst the other scrub, absolutely without water or any attention; and this last season we had about the worst season we have ever known. The later spring rains were entirely absent, and the winter rains did not start until June."

51282. CALLITRIS CUPRESSIFORMIS Vent. Pinaceæ.

"A plant with handsome cones, very upright growth, and somewhat dingy green foliage commonly characteristic of the genus."

For previous introduction, see S. P. I. No. 47151.

51283. CALLITRIS DRUMMONDII (Parl.) Benth. Pinaceæ.

"This plant is undoubtedly a real acquisition as a dwarf, globose, bright-green, ornamental, cypresslike tree."

51284. TRICHILIA EMETICA Vahl. Meliaceæ.

From Lourenco Marques, Portuguese East Africa. Seeds presented by John A. Ray, American consul. Received September 23, 1920.

"Known in Portuguese East Africa under the native names *umkuhlu, marba, marwa-maawa, gnande, mafouriera, mafura,* or *mafurrera,* where they have long been known as the source of *mafura* tallow, a vegetable fat used by the natives for greasing the skin. The fat consists of about 55 per cent oleic acid and 45 per cent palmitic acid, and has been used in the manufacture of soap." (*W. W. Stockberger.*)

For previous introduction, see S. P. I. No. 21965.

51285. ALLIUM SATIVUM L. Liliaceæ. Garlic.

From Seoul, Chosen. Sets presented by Dr. S. Hashimoto, director, Agricultural and Industrial Station of the Government General of Chosen, Suigen, Chosen, through Ransford S. Miller, consul general, Seoul Received September 30, 1920.

"Sets of the best commercial varieties of garlic." (*Miller.*)

51286. PENNISETUM PURPUREUM Schumach. Poaceæ. Grass.

From Wynberg, Cape Colony. Seeds presented by J. B. Taylor. Received September 17, 1920.

"A good fodder grass from the Mazoe Valley in Rhodesia; it grows in clumps like Napier fodder. It is a sweeter, more succulent, and softer grass than Napier. Mr. Holland, of Port Elizabeth, is a breeder of pedigreed shorthorns, and has a large dairy; he has experimented with *fufu* grass and is loud in praise of it." (*Taylor.*)

51287 to 51297. ZEA MAYS L. Poaceæ. **Corn.**

From Maison Carree, Algeria. Seeds presented by Prof. L. Ducellier, Laboratoire d'Agriculture, Ecole d'Agriculture Algerienne. Received September 28, 1920.

"Maize cultivated at the School of Agriculture. The seeds I am sending were obtained from a single plant. This hybrid corn did better during the exceptionally dry season of 1920 than Navajo maize." (*Ducellier.*)

51287. No. 1. Small flattish red grains.

51288. No. 2. Small, rounded, red grains.

51289. No. 3. Ear with equal number of yellow and grayish, small, flat to roundish grains.

51290. No. 4. Small, flattish, orange-colored grains.

51291. No. 5. Small, flat, yellowish orange grains.

51292. No. 6. Ear with three-fourths of its grains yellow, one-fourth grayish violet; grains small, flat to roundish.

51293. No. 7. Small, flat to roundish, yellow grains.

51294. No. 8. Small, flat to roundish, very pale-yellow grains.

51295. No. 9. Very small, thick, whitish grains.

51295. No. 9. Very small, thick, whitish grains.

51297. No. 11. Small, rounded, dark-red grains.

51298 to 51305. AVENA SATIVA L. Poaceæ. **Oats.**

From Madrid, Spain. Seeds presented by the director, Escuela Especial de Ingenieros Agrónomos, through Ely E. Palmer, American consul. Received September 28, 1920.

"These are of the type of our *Winter Turf* or *Virginia Gray* oats." (*C. W. Warburton.*)

51298. *Avila.*
51299. *Ciudad Real.*
51300. *Guadalajara.*
51301. *Madrid.*
51302. *Segovia.*
51303. *Toledo.*
51304. *Toledo.*
51305. *Valladolid.*

51306 to 51333.

From Kisantu, Belgian Kongo. Seeds presented by Father Hyacinth Vanderyst. Received July 29, 1920.

Numbered for convenience in testing by the Office of Forage-Crop Investigations.

51306 to 51308. CHLORIS spp. Poaceæ. Grass.

51306. CHLORIS sp.
51307. CHLORIS sp.
51308. CHLORIS sp.

51309. CYMBOPOGON sp. Poaceæ. Grass.

51310. CYPERUS sp. Cyperaceæ. Sedge.

51311. CHLORIS RADIATA (L.) Swartz. Poaceæ. Grass.

51312. ELEUSINE CORACANA (L.) Gaertn. Poaceæ. Ragi millet.

This is the well-known millet of the tropical regions of the Old World, where it forms a large part of the diet of many of the natives of India and tropical Africa.

For previous introduction, see S. P. I. No. 48456.

51313. ERAGROSTIS sp. Poaceæ.

51314. INDIGOFERA sp. Fabaceæ.

51306 to 51333—Continued.

51315. MELINIS MINUTIFLORA Beauv. Poaceæ. **Grass.**

A Brazilian grass which forms a dense carpet 3 or 4 feet thick; the blades of this grass are covered with a kind of wax, which is said to be sufficient to polish one's boots when walking through a thick growth of it. It is unusually palatable to cattle and horses. (Adapted from *note under S. P. I. No. 41148*, which see for previous introduction.)

51316. PANICUM sp. Poaceæ. **Grass.**

51317. PASPALUM SCROBICULATUM L. Poaceæ. **Koda millet.**

An erect annual grass, averaging 2 feet in height, native to India, where it is also extensively cultivated for the edible grain. The grain is poisonous, however, unless kept for a number of years. Cattle are fond of the grass before it ripens; when it is ripening it is poisonous to stock. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 6, pt. 1, p. 111.*)

For previous introduction, see S. P. I. No. 35332.

51318 to 51323. SPOROBOLUS spp. Poaceæ. **Grass.**

51318. SPOROBOLUS sp. **51321.** SPOROBOLUS sp.

51319. SPOROBOLUS sp. **51322.** SPOROBOLUS sp.

51320. SPOROBOLUS sp. **51323.** SPOROBOLUS sp.

51324 to 51331. SYNTHERISMA spp. Poaceæ. **Grass.**

51324. SYNTHERISMA sp. **51328.** SYNTHERISMA sp.

51325. SYNTHERISMA sp. **51329.** SYNTHERISMA sp.

51326. SYNTHERISMA sp. **51330.** SYNTHERISMA sp.

51327. SYNTHERISMA sp. **51331.** SYNTHERISMA sp.

51332 and 51333. TRISTACHYA spp. Poaceæ. **Grass.**

51332. TRISTACHYA sp. **51333.** TRISTACHYA sp.

51334 to 51343.

From Kenia, British East Africa. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received September, 1920.

A collection of grasses from British East Africa.

51334. ANDROPOGON TRICHOPUS Stapf. Poaceæ. **Grass.**

"(No. 1093. Fort Hall, Kenia Province. June 17, 1920.) A tall grass abundant along roadways."

51335. CAPRIOLA DACTYLON (L.) Kuntze. Poaceæ. **Grass.**

"(No. 1060. En route from Meru to Embu, Kenia Province. June 16, 1920.) A grass which forms large mats in the roadway in this mountain country."

For previous introduction, see S. P. I. No. 44098.

51336. CHAETOCHLOA AUREA (Hochst.) Hitchc. Poaceæ. **Grass.**

"(No. 1077. Embu, Kenia Province. June 17, 1920.) A tall grass, abundant but never dominant over large areas."

For previous introduction, see S. P. I. No. 38773.

51334 to 51343—Continued.

51337 and 51338. CHAETOCHLOA SULCATA (Aubl.) Hitchc. Poaceæ. Grass.

51337. "(No. 1063. Chuka, Kenia Province. June 16, 1920.) A very large grass with broad leaves and many ribs."

For previous introduction, see S. P. I. 38776.

51338. "(No. 1068. Chuka, Kenia Province. June 16, 1920.) A grass with rather large leaves; grown in clumps."

51339. CHLORIS RADIATA (L.) Swartz. Poaceæ. Grass.

"(No. 1076. Embu, Kenia Province. June 17, 1920.) A very fine grass with small stipalike seeds."

For previous introduction, see S. P. I. No. 51311.

51340. CYMBOPOGON CYMBARIUS (L.) Rendle. Poaceæ. Grass.

"(No. 1061. En route from Meru to Embu, Kenia Province. June 16, 1920.) A coarse grass, not dominant anywhere, but relatively common in the mountain country."

51341. ECHINOCHLOA CRUSGALLI EDULIS Hitchc. Poaceæ. Grass.

"(No. 1053. Meru, Kenia Province. June 16, 1920.) A tall grass growing along waterways. It produces excellent growth on wet lands."

For previous introduction, see S. P. I. No. 49693.

51342. MELINIS MINUTIFLORA Beauv. Poaceæ. Grass.

"(No. 1055. En route from Meru to Embu, Kenia Province. June 15, 1920.) A purple-topped grass occurring only in the hill country, where it forms small colonies to the exclusion of other plants."

For previous introduction, see S. P. I. No. 51315.

51343. PANICUM sp. Poaceæ. Grass.

"(No. 1066. Chuka, Kenia Province. June 16, 1920.) A delicate form growing in the bush and open forest region."

51344. ANIGOZANTHOS MANGLESII D. Don. Amaryllidaceæ.

From Perth, Western Australia. Seeds presented by H. C. Trethowan, Undersecretary for Agriculture. Received September 21, 1920.

An amaryllidaceous plant native to the Swan River country of southwestern Australia. It bears scorpioid racemes on stout, woolly, bright-red stems. The lustrous green, tomentose spathes are square at the end, recurved, and bear the stamens on the curve. (Adapted from the *Pacific Garden, vol. 7, p. 11.*)

51345 and 51346.

From Aguascalientes, Aguascalientes, Mexico. Presented by Luther K. Zabriskie, American consul. Received September 25, 1920.

51345. DAHLIA sp. Asteraceæ. Dahlia.

Dahlia roots included in the shipment of tubers of *hierba de chicle.*

51346. EUPHORBIA sp. Euphorbiaceæ.

Tubers of the *hierba de chicle.*

"These were brought to my attention by Redick R. Moore, an American mining engineer, who interested himself in the plant after noting the fact that the skin or husk of the tuber was commonly employed by the natives as chewing gum, and that the same resolved itself into an India-rubberlike substance after being chewed. The plant grows in

51345 and 51346—Continued.

crevices between volcanic rocks, rhyolitic in nature, at an elevation of about 7,000 feet. These tubers came from the so-called 'La Punta Hacienda,' about 7 miles northwest of Rincon de Romos, Aguascalientes." (*Zabriskie.*)

51347 to 51350.

From Bogota, Colombia. Collected by Wilson Popenoe, Agricultural Explorer of the Bureau of Plant Industry. Received September 25, 1920. Quoted notes by Mr. Popenoe.

51347. CANNA sp. Cannaceæ. Canna.

"(No. 433a. Santa Marta, Colombia. August 5, 1920.) Seeds of a common wild plant in the mountains south of Santa Marta, at altitudes not exceeding 2,000 feet. Its stems reach to 8 or 10 feet and are surmounted by clusters of small flowers, bright yellow, spotted with orange-red. Of interest only to those engaged in canna breeding."

51348 and 51349. SOLANUM TUBEROSUM L. Solanaceæ. Potato.

51348. "(No. 435. Bogota. August 27, 1920.) Tubers of the *Caicera* potato, from the Bogota market. A somewhat flattened, smooth-skinned, rose-colored potato of very good quality. One of the favorite varieties in this part of the Andes."

51349. "(No. 436. Bogota. August 27, 1920.) Tubers of the *Tempranera* potato (early). From the Bogota market. An early variety of round form, rather small size, and light-brown skin. One of the principal varieties of this part of the Andes."

51350. ZEA MAYS L. Poaceæ. Corn.

"(No. 434a. Bogota. August 27, 1920.) Native pop corn. The ears are from 4 to 6 inches long, the grains pale straw colored and translucent. It is said to come from the lowlands, and is much used as an article of food in Bogota, the grains being popped in the same manner as in the United States."

51351 to 51357.

From Bogota, Colombia. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received September 29, 1920. Quoted notes by Mr. Popenoe.

51351. DATURA sp. Solanaceæ.

"(No. 441a. Bogota. September 4, 1920.) Seeds of *borrachero*, or *chocolate sabanero*, from above Esperanza, Cundinamarca, at an altitude of about 6,000 feet. The common tree datura of the Bogota mesa and surrounding regions, used by the ancients as a narcotic."

51352. FRAGARIA VESCA L. Rosaceæ. Strawberry.

"(No. 445. Bogota. September 4, 1920.) Plants of the *fresa*, the common wild strawberry of this section of the Andes, found in Cundinamarca on mountain slopes at altitudes of approximately 6,000 to 8,000 feet. The fruit is brought into the Bogota market in considerable quantities, and is said to be available at all seasons of the year. It is small, rarely over half an inch long, broadly oval to nearly round, and of pleasant flavor."

51351 to 51357—Continued.

51353. SOLANUM sp. Solanaceæ.

"(No. 440a. Bogota. September 4, 1920.) Seeds of a half-woody vine which climbs over small trees in the vicinity of Cachipay, on the railway between Bogota and Girardot (altitude about 6,000 feet). It has a leaf much like the tomato vine, and its small, white, star-shaped flowers are followed by clusters of egg-shaped fruits about half an inch long and of a bright brownish orange. I am told that these fruits are not edible, but I am inclined to think they are harmless."

51354. RUBUS URTICAEFOLIUS Poir. Rosaceæ. Blackberry.

"(No. 438a. Bogota. September 4, 1920.) Seeds of a wild blackberry which is excellent, though the fruit is rather small. It is found on the mountain slopes at altitudes of 5,000 to 6,000 feet, above Esperanza, on the railway from Bogota to Girardot. The canes reach a length of about 10 feet and are more or less erect in habit. The flowers are small and white. The berries are produced in large clusters; individually they are one-half to three-quarters of an inch long, with the drupelets which compose them small, deep purple, and set closely together. The flavor of the ripe berry is sweet and pleasant."

51355. SOLANUM TUBEROSUM L. Solanaceæ. Potato.

"(No. 442. Bogota. September 4, 1920.) Tubers of the *Criolla* potato from the Bogota market. One of the principal varieties cultivated in this region. A round, rather small, red-skinned potato with deep eyes."

51356. ZEA MAYS L. Poaceæ. Corn.

"(No. 443a. Bogota. September 4, 1920.) Seeds of a peculiar variety of corn, with sulphur-yellow, starchy kernels; from the Bogota market."

51357. ERYTHRINA EDULIS Triana. Fabaceæ.

"(No. 437a. Bogota. September 4, 1920.) Seeds of a plant called *balu* in Cundinamarca; *chachafruto* in Antioquia; and *frijol nopas* in Santander.

"A small, soft-wooded tree whose seeds are an important article of food in certain parts of Colombia, notably on the western slope of the Cordillera Oriental. It is sometimes planted among coffee trees to provide shade for them, and it is often seen in dooryards and about the gardens of the natives. Anolaima, in Cundinamarca, is said to be one of the most important centers of production. The tree is grown in this part of Colombia at altitudes of 5,500 to 6,500 feet. The fact that it is seen only within this narrow zone would indicate that it is rather exacting in its climatic requirements.

"The tree grows to a height of 25 or 30 feet. The leaves are trifoliolate, with the oblong-ovate to ovate, acute leaflets sometimes as much as 8 inches long. The flowers, produced in erect spikes, are about three-quarters of an inch long, and orange-scarlet. The fruit is a plump pod 6 to 18 inches long and about an inch thick. It contains several brown seeds of the form and character of the common bean, but much larger; they are usually 1 to 2 inches long, and very plump.

51351 to 51357—Continued.

"When fully mature, the pods (which are often borne in clusters of four or five) are picked and the beans prepared for eating by boiling in salted water. The leathery brown integument must first be removed; the cotyledons are then found to be white, tender, of very fine, somewhat mealy texture, and of an agreeable flavor suggesting that of the white bean, but more delicate, with a trace of sweetness.

"The Indians reckon the balu among their best foods. I believe the plant will succeed in southern Florida, but it is probably too tender for California."

INDEX OF COMMON AND SCIENTIFIC NAMES.

Abutilon sp., 51216.
Acacia catechu, 50711.
Achimenes sp., 51195.
Aeluropus brevifolius, 51110.
Agathis loranthifolia. See *Dammara alba*.
Agave cantala, 51206.
Aggak, *Pandanus tectorius*, 51138.
Agrostis sp., 51158.
Albizzia chinensis, 50712, 51143.
lebbeck, 50713.
montana, 50694.
stipulata. See *A. chinensis*.
Alectryon subcinereum, 51000.
Alfalfa, *Medicago sativa*, 51157.
Allium cepa, 51255.
sativum, 51285.
Almond, *Amygdalus communis*, 51103. 51104.
Alnus nepalensis, 50714.
Altingia excelsa, 50695.
Alvaradoa amorphoides, 50652.
Amaranth, *Amaranthus* sp., 50726.
Amaranthus sp., 50726.
Amygdalus communis, 51103, 51104.
persica, 51162, 51163.
Anacardium occidentale, 51249.
Ananas sativus, 50649, 50727.
Anchusa rosea. See *Nonnea rosea*.
Andes berry, *Rubus glaucus*, 50691.
Andropogon sp., 50686.
trichopus, 51334.
Anigozanthos manglesii, 51344.
Annona cherimola, 51003, 51013, 51217
muricata, 50728, 51050.
reticulata, 50729, 50730, 51014.
senegalensis, 50731.
squamosa, 51015.
Anthephora pubescens, 51111.
Apple, *Malus pumila:*
Paradise, 51164.
Apple, *Malus sylvestris:*
Aerial, 51165.
Alpha, 51166.
Ballarat, 51167.
Bordeaux Reinette, 51168.
Coles Champion, 51169.
Cowell's Red Streak, 51170.
Frimley Beauty, 51171.
Imm's Seedling, 51172.
Irish Peach seedling, 51173.
Lippiatt's, 51174.
Lord Nelson, 51175.
Mobb's, 51176.
Mobb's Royal, 51177.
Motion's, 51178.
Ruby Gem, 51179.
Arachis hypogaea, 50732.
Ardisia spp., 51052, 51053.
Areca catechu, 50733, 51127.
Artocarpus integra, 51012.
integrifolia. See *A. integra*.
Arundinella berteroniana, 51069.
deppeana, 51184.
Asclepias curassavica, 50678.
Aspidosperma peroba, 51107.
Attalea sp., 51024.
Avena sativa, 51199, 51202, 51298-51305.
sterilis, 51203.
Avocado, *Persea americana*, 50680, 50688, 50968, 51029–51031, 51105, 51208.
Dade, 50968.
Axonopus sp., 51159.

Backhousia citriodora, 51062.
Bactris utilis. See *Guilielma utilis*.
Balinaonao, *Otophora fruticosa*, 51106.
Balu, *Erythrina edulis*, 51357.
Bamboo, *Dendrocalamus giganteus*, 51026.
Schizostachyum sp., 50648.

Barberry. See *Berberis* spp.
Barisber, *Mezoneurum scortechinii*, 51253.
Barley, *Hordeum vulgare coeleste:*
naked, 51229.
Nebawi, 51209.
Barreto, *Plocosperma buxifolium*, 50667.
Bassia latifolia. See *Madhuca indica.*
Bauhinia kappleri, 50734.
Bean, bonavist, *Dolichos lablab*, 50760.
common, *Phaseolus vulgaris*, 50845–50901, 50965, 50966, 51079–51084, 51198.
Lima, *Phaseolus lunatus*, 50999.
mung, *Phaseolus aureus*, 50962–50964.
soy, *Soja max*, 51042–51046.
sword, *Canavali gladiatum*, 50739.
wild, *Canavali* sp., 51281.
Begonia sp., 51058.
Bejuco blanco, *Ipomoea* sp., 50661.
Berberis napaulensis, 50715.
Berry, Andes, *Rubus glaucus*, 50691.
Bischofia javanica. See *B. trifoliata.*
trifoliata, 51194.
Blackberry, *Rubus spp.*, 50681, 51033, 51123, 51354.
Blakea spp., 51074, 51075.
Blumea balsamifera. See *Placus balsamifer.*
Bombax malabaricum, 50716.
Borrachero, *Datura* sp., 51351.
Brachiaria brizantha, 50687.
Bramble, *Rubus* sp., 50907.
Brazil, *Haematoxylum brasiletto*, 50660.
Bromus sp., 51057.
Broom, Spanish, *Spartium junceum*, 51151.
Bunchosia glandulifera, 51116.
Byrsocarpus sp., 50735.

Cacho de chibo, *Tabebuia* sp., 50673.
Caesalpinia exostemma, 50653.
Cajan indicum, 50736–50738.
Caju, *Anacardium occidentale*, 51249.
Callitris cupressiformis, 51282.
drummondii, 51283.
Calophyllum inophyllum, 51218.
Campana, *Cydista pubescens*, 50656.
Canavali sp., 51281.
gladiatum, 50739.
Canna spp., 50740, 50741, 51347.
Capparis micracantha, 51191.
Capriola dactylon, 51335.
Capsicum annuum, 50742, 50743, 51054.
Carcomo, *Caesalpinia exostemma*, 50653.
Carica sp., 51250.
papaya, 50970.
Carissa carandas, 51005.
Caryota mitis, 51128.
Cashew, *Anacardium occidentale*, 51249.
Cassava, *Manihot esculenta*, 50837, 50838, 51126.
Cassia bicapsularis, 50654.
elegans, 51061.
emarginata, 50655.
laevigata, 51219.
occidentalis, 51220.
siamea, 50744.
Castilla nicoyensis, 51117.
Castor-bean, *Ricinus communis*, 50904–50906, 51236–51238.
Catjang, *Vigna cylindrica*, 50930, 50931.
Ceiba pentandra, 50745, 50746.
Cereza, *Bunchosia glandulifera*, 51116.
Cestrum sp., 51008.
Chaetochloa sp., 50689.
aurea, 51336.
geniculata, 51070.
lutescens, 50690.
sulcata, 51071, 51185, 51186, 51337, 51338.
Chayota edulis, 50682, 51056.
Chayote, *Chayota edulis*, 50682, 51056.
Chenopodium album, 51214.
Cherimoya, *Annona cherimola*, 51003, 51013, 51217.
Chick-pea, *Cicer arietinum*, 51076.
Chloris spp., 51306–51308.
radiata, 51311, 51339.
Chocolate sabanero, *Datura* sp., 51351.
Choreque, *Securidaca sylvestris*, 50671.
Chununo, *Macroscepis obovata*, 50658.
Cicer arietinum, 51076.
Cissus sp., 50747.
Citrullus vulgaris, 51180, 51181.
Citrus sp., 50967.
australasica. See *Microcitrus australasica.*
sinensis, 51215.
Clematis sp., 50748.
Clover. See *Trifolium* spp.
Coccolobis sp., 50683.
Cochlospermum hibiscoides. See *Maximilianea vitifolia.*
Coix lacryma-jobi, 51196.

Cok-pechadya, *Agrostis* sp., 51158.
Cola de pato, *Cassia bicapsularis*, 50654.
Coleus barbatus, 51239.
Colocasia sp., 50710.
Colutea galegifolia. See *Swainsona galegifolia*.
Convolvulus mauritanicus, 51098.
Coralillo, *Stigmaphyllon* sp., 50672.
Cordia sp., 51101.
nitida, 51118.
Cordoncilla, *Piper tuberculatum*, 51059, 51264.
Corn, *Zea mays*, 50947–50956, 51244. 51287–51297, 51356.
pop, *Zea mays*, 51350.
Corylus avellana, 51077, 51078.
Cotton, *Gossypium* spp., 50775–50778, 51010, 51028.
kidney, *Gossypium* spp., 50775, 50776, 50778.
Cowpea, *Vigna sinensis*, 50932–50942
Cracca sp., 50750.
polystachya, 50749.
Crotalaria spp., 50752–50754.
striata, 50751.
usaramoensis, 51207.
verrucosa, 51119.
Cruzito, *Podopterus guatemalensis*, 50669.
Cucumber, *Cucumis* spp., 50755–50757, 51221, 51222.
Cucumis sp., 51221.
anguria, 51222.
melo, 51102, 51156, 51256.
sativus, 50755–50757.
Cucurbita pepo, 50758, 51022, 51034, 51035.
Cuero de zapo, *Petrea arborea*, 50665.
Cupang, *Parkia timoriana*, 50701.
Cupania sp., 51120.
Custard-apple, *Annona reticulata*, 50729, 50730, 51014.
Cyathea sp., 51007.
Cyclanthera pedata, 51004.
Cydista pubescens, 50656.
Cymbopogon spp., 50759, 51309.
cymbarius, 51340.
Cyperus sp., 51310.
Cyphomandra betacea, 51223.

Dactylis aschersoniana, 51183.
Dahlia spp., 51086–51090, 51345.
Dammara alba, 51129.
Datura sp., 51351.
Dendrocalamus giganteus, 51026.
Desmodium sp. See *Meibomia* sp.
Desmoncus sp., 51258.
Digitaria sp., 51311.
iburua, 51257.
Dioscorea sp., 51224.
Djianitu, *Elaeocarpus sphaericus*, 50696.
Dolicholus sp., 50761.
phaseoloides, 51027.
Dolichos lablab, 50760.
Doryanthes palmeri, 51063.
Drymophloeus sp., 51130.
Duruche, *Jacquinia gracilis*, 50662, 50663.

Echinochloa crusgalli edulis, 51341.
Eggplant, *Solanum melongena*, 50910–50918, 50971.
Elacis guineensis, 50762, 51016–51021.
Elaeocarpus ganitrus. See *E. sphaericus*.
sphaericus, 50696.
Elaeodendron capense, 51144.
Eleusine coracana, 50763, 50998, 51312.
Embothrium speciosissimum. See *Telopea speciosissima*.
Entelea arborescens, 51047.
Eragrostis spp., 50766, 50767, 51313.
tremula, 50764, 50765.
Eriobotrya hookeriana, 50717.
Eriodendron anfractuosum. See *Ceiba pentandra*.
Erythrina sp., 50768.
edulis, 51357.
Eucalyptus risdoni, 51064.
Eugenia curranii, 51201.
jambolana. See *Syzygium cumini*.
Euphorbia sp., 51346.
leucocephala, 50657.

Fern, tree, *Cyathea* sp., 51007.
Ficus spp., 50700, 50769, 51252.
nota, 50697.
odorata, 50698.
ulmifolia, 50699.
Fig. See *Ficus* spp.
Flor de mico, *Phyllocarpus septentrionalis*, 50666.
de pascua, *Euphorbia leucocephala*, 50657.

Fragaria vesca, 51352.
Fresa. See Strawberry, **51352.**
Fruta de pava, undetermined, **50692.**
Fuchsia speciosa, 51001.

Garcinia mangostana, 51200.
Garlic, *Allium sativum*, 51285.
Gengibrillo, *Paspalum notatum*, 51121.
Genista monosperma, 51145.
Gladiolus spp., 50770–50772, 51225.
segetum, 51146.
Gloriosa sp., 50773.
simplex, 51234.
Gomphocarpus physocarpus, 50774.
Gomphrena rosea, 51108.
Gossypium spp., 50775–50778, 51010, 51028.
Gourd, *Cucurbita pepo*, 51022, 51023, 51034, 51035.
Lagenaria vulgaris, 51023.
Loofah, *Luffa acutangula*, 51230.
Granadilla, giant, *Passiflora quadrangularis*, 51093.
sweet, *Passiflora ligularis*, 51055.
Granadillo, undetermined, 50675.
Grape, *Vitis* sp., 50943.
Grass, *Aeluropus brevifolius*, 51110.
Agrostis sp., 51158.
Andropogon sp., 50686.
trichopus, 51334.
Anthephora pubescens, 51111.
Arundinella berteroniana, 51069.
deppeana, 51184.
Axonopus sp., 51159.
Brachiaria brizantha, 50687.
Bromus sp., 51057.
Capriola dactylon, 51335.
Chaetochloa sp., 50689.
aurea, 51336.
geniculata, 51070.
lutescens, 50690.
sulcata, 51071, 51185, 51186, 51337, 51338.
Chloris spp., 51306–51308.
radiata, 51311, 51339.
Cymbopogon spp., 50759, 51309.
cymbarius, 51340.
Dactylis aschersoniana, 51183.
Digitaria iburua, 51257.
Echinochloa crusgalli edulis, 51341.
Grass, *Eragrostis* spp., 50766, 50767, 51313.
Eragrostis tremula, 50764, 50765.
Fu-fu, *Pennisetum purpureum*, 51286.
Heteropogon contortus, 51226.
Isachne arundinacea, 51187, 51197.
Ischaemum latifolium, 51095.
Ixophorus unisetus, 50650.
Kamerun, *Holcus sorghum effusus*, 50782, 50783, 50785, 50795, 50801, 50802.
Melinis minutiflora, 51315, 51342.
Miscanthus nepalensis, 50719.
Natal, *Tricholaena rosea*, 50925, 50926.
Panicum spp., 51316, 51343.
fasciculatum, 51260.
millegrana, 51259.
multirameum, 51097.
olivaceum, 51188.
Paspalum conjugatum, 51189.
denticulatum, 51261.
humboldtianum, 51096.
notatum, 51121, 51262.
paniculatum, 51072, 51190.
plicatulum, 51263.
scrobiculatum, 51317.
Pennisetum purpureum, 51286.
Phleum pratense, 51269–51279.
rye, Wimmera, *Lolium perenne*, 51213.
Sporobolus spp., 50920, 51318–51323.
indicus, 51160.
pyramidalis, 50921.
Sudan, *Holcus sorghum sudanensis*, 50780, 50781.
Syntherisma spp., 51324–51331.
tabucki, *Holcus sorghum verticilliflorus*, 50789, 50791–50794, 50796, 50798, 50800, 50803, 50807, 50808.
Trichopteryx sp., 50927.
Trisetum deycuxioides, 51161.
Tristachya spp., 51332, 51333.
Wimmera rye, *Lolium perenne*, 51213.
Grewia asiatica. See *Microcos lateriflora*.
occidentalis, 51147.
Guaiacum guatemalense, 50659.

Guayacan, *Guaiacum guatemalense*. 50659.
Guava, *Psidium guajava*, 50903, 51038–51040.
Guilielma utilis, 50679, 51051, 51091, 51092.
Gundelia tournefortii, 51142.

Haematoxylum brasiletto, 50660.
Hardenbergia monophylla. See *Kennedya monophylla*.
Hazelnut, *Corylus avellana*, 51077. 51078.
Heckeria sp., 51060.
Heteropogon contortus, 51226.
Hibiscus sp., 51227.
brackenridgei, 50693.
sabdariffa, 51268.
Hierba de chicle, *Euphorbia* sp., 51346.
Holcus sorghum, 50779, 50784, 50786–50788, 50790, 50797, 50799, 50804–50806, 50809–50829, 51228.
sorghum × effusus, 50782, 50783, 50785, 50795, 50801, 50802.
sudanensis, 50780, 50781.
verticilliflorus, 50789, 50791–50794, 50796, 50798, 50800, 50803, 50807, 50808.
Hordeum vulgare coeleste, 51209, 51229.

Iburu, *Digitaria iburua*, 51257.
Igname branca, *Colocasia* sp., 50710.
Indigo. See *Indigofera* spp.
Indigofera spp., 50830, 51314.
endecaphylla, 50831.
Inula royleana, 51037.
Ipomoea spp., 50661, 50832–50833.
nymphaeaefolia, 51192.
peltata. See *I. nymphaeaefolia*.
pulchella, 50834.
Isachne arundinacea, 51187, 51197.
Ischaemum latifolium, 51095.
Ixophorus unisetus, 50650.

Jaboncillo, *Sapindus saponaria*, 50670.
Jaboticaba, *Myrciaria cauliflora*, 51266, 51267.
murta mineira, *Myrciaria cauliflora*, 51267.
Jack fruit, *Artocarpus integra*, 51012.
Jacote mico, *Simarouba glauca*, 50676
Jacquinia gracilis, 50662, 50663.
Jaffa orange, *Citrus sinensis*, 51215.
Jambolan, *Syzygium cumini*, 50922, 51100.
Jatropha curcas, 50835.
Job's-tears, *Coix lacryma-jobi*, 51196.
Jujube, *Ziziphus* spp., 51114, 51115.

Kapok, *Ceiba pentandra*, 50745, 50746.
Karanda, *Carissa carandas*, 51005.
Karwinskia sp., 50677.
Kennedia monophylla, 51065.
K-ohl, *Coix lacryma-jobi*, 51196.

Lagenaria vulgaris, 51023.
Lairen, *Maranta* sp., 50684.
Latania commersonii, 51131.
Lavender, sea, *Limonium fruticans*, 51148.
Lebbeck tree, *Albizzia lebbeck*, 50713.
Licuala rumphii, 51132.
Lime, Chinese, *Citrus* sp., 50967.
finger, *Microcitrus australasica*, 51011.
Limonium fruticans, 51148.
Lobelia rosea, 50718.
Lolium perenne, 51213.
Lomatia ilicifolia. See *Tricondylus fraseri*.
Lucern, *Medicago sativa*, 51157.
Luffa acutangula, 51230.
Lycopersicon esculentum, 50836, 51182.

Macroscepis obovata, 50658.
Macui, *Solanum* sp., 51265.
Madhuca indica, 51155.
Malus pumila, 51164.
sylvestris, 51165–51179.
Malvastrum capense, 51149.
Mamão Caranus, *Carica* sp., 51250.
Mangabas, undetermined, 51251.
Mangosteen, *Garcinia mangostana*, 51200.
Manihot esculenta, 50837, 50838, 51126.
utilissima. See *M. esculenta*.
Manzanito, *Karwinskia* sp., 50677.
Maranta sp., 50684.
Martinezia caryotaefolia. See *Tilmia caryotaefolia*.
Maximilianea vitifolia, 50664.
Medicago sativa, 51157.
Meibomia sp., 50839.

Melinis minutiflora, 51315, 51342.
Meryta sinclairii, 51049.
Metrosideros tomentosa, 51048.
Mezoneurum scortechinii, 51253.
Microcitrus australasica, 51011.
Microcos lateriflora, 51006.
Millet, koda, *Paspalum scrobiculatum*, 51317.
pearl, *Pennisetum glaucum*, 50843, 50844, 50961.
ragi, *Eleusine coracana*, 50763 50998, 51312.
Miscanthus nepalensis, 50719.
Mopia, undetermined, 50960.
Mora, *Rubus* spp., 51094, 51123.
de Castilla, *Rubus glaucus*, 50691.
Morning-glory, *Convolvulus mauritanicus*, 51098.
Ipomoea spp., 50661, 50832–50834.
nymphaeaefolia, 51192.
Morus indica, 50720.
Mowra tree, *Madhuca indica*, 51155.
Mulberry, *Morus indica*, 50720.
Muñeco, *Cordia nitida*, 51118.
Musa ensete, 51231.
Muskmelon, *Cucumis melo*, 51102, 51156.
Aggur, *Cucumis melo*, 51256.
Myrciaria cauliflora, 51266, 51267.

Nectandra glabrescens, 50685.
Nephelium leiocarpum. See *Alectryon subcinereum*.
Nephrosperma van-houtteanum, 51133.
Nicotiana tabacum, 50840, 50841, 51232.
Nonnea rosea, 51041.

Oak. See *Quercus* spp.
Oats, *Avena sativa*, 51199, 51202, 51298–51305.
Avila, 51298.
Ciudad Real, 51299.
Gray, 51202.
Guadalajara, 51300.
Madrid, 51301.
Segovia, 51302.
Toledo, 51303, 51304.
Valladolid, 51305.
Oats, *Avena sterilis*, 51203.
Fair, 51203.
Obel, *Heckeria* sp., 51060.
Ochna leptoclada, 50842.
Olea europaea, 50972–50997.
Olive, *Olea europaea*, 50972–50997.
Atroviolacea Brun Bibier, 50972.
Black Italian, 50973.
Bouquetier, 50974.
Bouteillon, 50975.
Corregiolo, 50976.
Cushine, 50977.
Frantoja, 50978.
Grossee Redowno, 50979.
Hardy's Mammoth, 50980.
Institute, 50981.
Large Fruiting, 50982.
Late Blanquette, 50983.
Longue d'Ascoli, 50984.
Lucca, 50985.
Morchioso, 50986.
Morocco, 50987.
Palermo, 50988.
Picholin, 50989.
Pueblano, 50990.
Royal de Languedoc, 50991.
Rubra Caillon de Aix, 50992.
Saint Catherine, 50993.
Salome, 50994.
Sir George Gray's Spanish, 50995.
Verdale, 50996.
White, 50997.
Olneya tesota, 51254.
Oncosperma filamentosum, 51134.
Onion, *Allium cepa*, 51255.
Orange, Shamooti, *Citrus sinensis*, 51215.
Oreodoxa regia. See *Roystonea regia*.
Oryza sativa, 51233.
Otophora fruticosa, 51106.

Pachira fastuosa, 51204.
macrocarpa. See *P. fastuosa*.
Palm, *Attalea* sp., 51024.
betel-nut, *Areca catechu*, 50733, 51127.
Caryota mitis, 51128.
Desmoncus sp., 51258.
Drymophloeus sp., 51130.
Guilielma utilis, 50679, 51051, 51091, 51092.
Latania commersonii, 51131.
Licuala rumphii, 51132.
Martinezia caryotaefolia. See *Tilmia caryotaefolia*.
Nephrosperma van-houtteanum, 51133.

Palm, oil, *Elaeis guineensis*, 50762, 51016–51021.
Oncosperma filamentosum, 51134.
Oreodoxa regia. See *Roystonea regia*.
royal, Cuban, *Roystonea regia*, 51139.
Scheelea insignis, 51140.
Tilmia caryotaefolia, 51141.
Palo de la Cruz, *Plumeria acutifolia*, 50668.
Pandanus furcatus, 51135.
labyrinthicus, 51136.
polycephalus, 51137.
tectorius, 51009, 51138.
Panicum spp., 51316, 51343.
brizanthum. See *Brachiaria brizantha*.
fasciculatum, 51260.
millegrana, 51259.
multirameum, 51097.
olivaceum, 51188.
Papaya, *Carica* spp., 50970, 51250.
Paraiso, *Cupania* sp., 51120.
Parkia roxburghii. See *P. timoriana*.
timoriana, 50701.
Paspalum conjugatum, 51189.
denticulatum, 51261.
humboldtianum, 51096.
notatum, 51121, 51262.
paniculatum, 51072, 51190.
plicatulum, 51263.
scrobiculatum, 51317.
Passang batoe, *Quercus javanica*, 50703.
bodas, *Quercus* sp., 50705.
djamba, *Quercus* sp., 50706.
keyan or keang, *Quercus* sp., 50707.
soeroe, *Quercus thelecarpa*, 50704.
tonogo, *Quercus* sp., 50708.
Passiflora sp., 51002.
ligularis, 51055.
macrocarpa, 51099.
mollissima, 51205.
quadrangularis, 51093.
Pea, garden, *Pisum sativum*, 50902.
Peach, *Amygdalus persica:*
Allen's Late, 51162.
Golden Queen, 51163.
Peanut, *Arachis hypogaea*, 50732.
Pennisetum glaucum, 50843, 50844, 50961.
purpureum, 51286.
typhoideum. See *P. glaucum*.
Pepper, *Heckeria* sp., 51060.
Piper tuberculatum, 51059.
red, *Capsicum annuum*, 50742, 50743, 51054.
Persea americana, 50680, 50688, 50968, 51029–51031, 51105, 51208.
caerulea, 51032.
gratissima. See *P. americana*.
Petrea arborea, 50665.
Petunia violacea, 51109.
Phaseolus aureus, 50962–50964.
lunatus, 50999.
vulgaris, 50845–50901, 50965, 50966, 51079–51084, 51198.
Phleum pratense, 51269–51279.
Phyllocarpus septentrionalis, 50666.
Pigeon-pea, *Cajan indicum*, 50736–50738.
Pine. See *Pinus* spp.
Pineapple, *Ananas sativus*, 50727.
Montufar, 50649.
Pinus halepensis pityusa, 51085.
oocarpa, 50651.
Piper sp., 51264.
tuberculatum, 51059.
Pisum sativum, 50902.
Placus balsamifer, 51036.
Plocosperma buxifolium, 50667.
Plumajillo, *Alvaradoa amorphoides*, 50652.
Plumeria acutifolia, 50668.
Podopterus guatemalensis, 50669.
Polakowskia tacaco, 51122.
Portulacaria afra, 50969.
Potato, *Solanum tuberosum:*
Caicera, 51348.
Criolla, 51355.
Tempranera, 51349.
Prunus amygdalus. See *Amygdalus communis*.
persica. See *Amygdalus persica*.
Psidium guajava, 50903, 51038–51040.
Pterocarpus indicus, 51235.
Pterospermum sp., 50702.
Pumpkin, *Cucurbita pepo*, 50758.
Pygeum acuminatum, 50721.

Quercus sp., 50705–50708.
incana, 50722.
javanica, 50703.
thelecarpa, 50704.

Rash tzimaaj, *Paspalum paniculatum*, 51190.
Raspberry. *Rubus criocarpus*, 51094.
Rice, *Oryza sativa*, 51233.
Ricinus communis, 50904–50906, 51236–51238.
Rondeletia amoena, 51150.
Roselle, *Hibiscus sabdariffa*, 51268.
Roystonea regia, 51139.
Rubber, Nicoya, *Castilla nicoyensis*, 51117.
Rubus spp., 50681, 50907.
adenotrichos, 51123.
costaricanus, 51033.
criocarpus, 51094.
glaucus, 50691.
rosaefolius, 50723.
urticaefolius, 51354.
Rumex maderensis, 50908.
Rynchosia phaseoloides. See *Dolicholus phaseoloides*.

Saba saba, *Rumex maderensis*, 50908.
Sac pachadya, *Paspalum conjugatum*, 51189.
Sapindus mukorossi, 50724.
saponaria, 50670.
Scheclea insignis, 51140.
Schima noronhae, 50709.
Schizostachyum sp., 50648.
Sechium edule. See *Chayota edulis*.
Securidaca sylvestris, 50671.
Sedge, *Cyperus* sp., 51310.
Sesame. See *Sesamum orientale*.
Sesamum orientale, 50909.
Setaria sulcata. See *Chaetochloa sulcata*.
Simarouba glauca, 50676.
Soapberry. See *Sapindus* spp.
Soja max, 51042–51046.
Solanum spp., 50919, 51265, 51353.
haematocladum, 51280.
melongena, 50910–50918, 50971.
tuberosum, 51348, 51349, 51355.
Sorghum, *Holcus sorghum*, 50779, 50784, 50786–50788, 50790, 50797, 50799, 50804–50806, 50809–50829, 51228.
Sorghum vulgare. See *Holcus sorghum*.
Soursop, *Annona muricata*, 50728, 51050.
Spanish broom, *Spartium junceum*, 51151.
Spartium junceum, 51151.
Spatholobus parviflorus, 50725.
roxburghii. See *S. parviflorus*.
Spekboom, *Portulacaria afra*, 50969.
Sporobolus spp., 50920, 51318–51323.
indicus, 51160.
pyramidalis, 50921.
Statice fruticans. See *Limonium fruticans*.
Stigmaphyllon sp., 50672.
Strawberry, *Fragaria vesca*, 51352.
Sugar-apple, *Annona squamosa*, 51015.
Suquinay, *Vernonia patens*, 50674.
Swainsona galegifolia, 51066.
Syntherisma spp., 51324–51331.
Syzygium cumini, 50922, 51100.

Tabebuia sp., 50673.
Tacaco, *Polakowskia tacaco*, 51122.
Tacso, *Passiflora mollissima*, 51205.
Talinum patens, 51193.
Taro, *Colocasia* sp., 50710.
Tecomasuche, *Maximilianea vitifolia*, 50664.
Telopea speciosissima, 51067.
Tempranera, *Solanum tuberosum*, 51349.
Tephrosia polystachya. See *Cracca polystachya*.
Tetrastigma sp., 50923.
Thunbergia gibsoni, 51240.
Tilmia caryotaefolia, 51141.
Timothy, *Phleum pratense*, 51269–51279.
Tobacco, *Nicotiana tabacum*, 50840, 50841, 51232.
Tokan-uuk, *Rubus glaucus*, 50691.
Tomato, *Lycopersicon esculentum*, 50836, 51182.
Tree-tomato, *Cyphomandra betacea*, 51223.
Trichilia emetica, 51284.
Trichodesma zeylanicum, 50924.
Tricholaena rosea, 50925, 50926.
Trichopteryx sp., 50927.
Trichosanthes sp., 50928.
Tricondylus fraseri, 51068.

Trifolium resupinatum, 51073.
subterraneum, 51212.
Trisetum decyeuxioides, 51161.
Tristachya spp., 51332, 51333.
Triticum aestivum, 51241, 51242.
durum, 50929, 51210, 51211.
vulgare. See *T. aestivum*.
Tulip, *Tulipa stellata*, 51113.
Tulipa stellata, 51113.

Undetermined, 50675, 50692, 50957–50960, 51025, 51245–51248, 51251.

Vainillo, *Cassia emarginata*, 50655.
Vernonia patens, 50674.
Viborana, *Asclepias curassavica*, 50678.
Vigna sp., 51243.
cylindrica, 50930, 50931.
sinensis, 50932–50942.
Vilis sp., 50943.
Voandzeia subterranea, 50944–50946.

Waratah, *Telopea speciosissima*, 51067.
Watermelon, *Citrullus vulgaris*, 51180, 51181.
Wercklea insignis, 51124, 51125.
Wheat, common, *Triticum aestivum*, 51241, 51242.
durum, *Triticum durum*:
(India), unnamed, 50929.
Mahmoodi, 51210.
Reyati, 51211.
Wigandia spp., 51153, 51154.
caracasana, 51152.

Xanthosoma sagittaefolium, 51112.

Yam, *Dioscorea* sp., 51224.
Yautia, *Xanthosoma sagittaefolium*, 51112.

Zacate blanco, *Lrophorus uniselus*, 50650.
Zea mays, 50947–50956, 51244, 51287–51297, 51350, 51356.
Ziziphus sp., 51115.
jujuba, 51114.
sativa. See *Z. jujuba*.

Issued May, 1923.

U. S. DEPARTMENT OF AGRICULTURE.
BUREAU OF PLANT INDUSTRY.

INVENTORY

OF

SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
DURING THE PERIOD FROM OCTOBER 1
TO DECEMBER 31, 1920.

(No. 65; Nos. 51358 to 52305.)



WASHINGTON
GOVERNMENT PRINTING OFFICE
1923

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CONTENTS.

	Page.
Introductory statement	1
Inventory	7
Index of common and scientific names	89

ILLUSTRATIONS.

		Page.
PLATE	I. The mountain papaya in full bearing. (*Carica candamarcensis* Hook. f.; S. P. I. No. 51389)	12
	II. A new vegetable from Colombia. (*Cyclanthera pedata* (L.) Schrad.; S. P. I. No. 51390)	12
	III. The giant Colombian berry. (*Rubus macrocarpus* Benth.; S. P. I. No. 51401)	12
	IV. A magnificent flowering tree from eastern Guatemala. (*Phyllocarpus septentrionalis* Donn.-Smith; S. P. I. No. 51409)	12
	V. The doum palm at home. (*Hyphaene thebaica* (L.) Mart.; S. P. I. No. 51440)	28
	VI. Native sorghums grown by the agricultural races of Kenia Colony, British East Africa. (*Holcus sorghum* L.; S. P. I. Nos. 51579 to 51581 and 51953 to 51957)	28
FIGURE	1. Map of South and East Africa, showing the route taken by Dr. H. L. Shantz in his Cape-to-Cairo agricultural exploration trip during the years 1919 and 1920	3

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INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM OCTOBER 1 TO DECEMBER 31, 1920 (NO. 65; NOS. 51358 TO 52305).

INTRODUCTORY STATEMENT.

During the autumn of 1920, the period covered by this inventory, Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture, was in Colombia and Ecuador, and his carefully selected plants comprise certain species heretofore unknown in North America. Those from the cool highlands may prove to be difficult to grow in this country because of their being accustomed to continual cool, foggy weather which at no time becomes cold enough to freeze. From Bogota he sends in the mountain papaya, *Carica candamarcensis* (No. 51389), which already seems to have proved its adaptability to the climate of San Diego, Calif.; *Cyclanthera pedata* (No. 51390), a new cucurbitaceous vegetable; a red-fruited passion vine, *Tacsonia* sp. (No. 51392); the capulin, *Prunus serotina* (No. 51393), a large-fruited wild cherry; the naranjilla, *Solanum quitoense* (No. 51394), with bright orange fruits like the tomato but with a leathery skin; a glossy yellow pepper, *Capsicum annuum* (No. 51396); and the curuba, *Tacsonia mollissima* (No. 51399), a large passion fruit, one of the most popular fruits of Bogota.

Mr. Popenoe's successful introduction of the Colombian blackberry, *Rubus macrocarpus* (Nos. 51401 and 51706), of El Penon, which has fruits more than 2 inches in length and is possibly the largest fruited species of all blackberries, should awaken the activities of the plant breeder and lead to crossing and selection work on a considerable scale to produce, if possible, larger and finer forms for the market.

Two new barberries, *Berberis rigidifolia* (No. 51787) and *B. quinduensis* (No. 51795), from an elevation of 9,000 feet in Colombia; a new holly, *Ilex* sp. (No. 51788), from the same region; and a crimson-flowered climber, *Mutisia clematis* (No. 51789), with flowers like small dahlias, are four of his finds.

The magnificent flowering tree, *Brownea grandiceps* (No. 51796), with flame-scarlet flowers in compact clusters; the canelo tree, *Drimys winteri* (No. 51797), with clusters of large white flowers; a species of Carica (No. 52299), with small fruits which are of a deep rich crimson color and very attractive but with whitish flesh, having an applelike scent; and a rapid-growing tree (No. 52304) from the Cauca Valley, which is worthy of trial as a street tree in southern Florida, are other results of his explorations.

JUL 3 1923

The appreciation which the spring-flowering trees inspire nowadays should make Mr. Popenoe's flor de mico tree, *Phyllocarpus septentrionalis* (No. 51409), which flowers in January and February with a mass of crimson-scarlet blooms, a popular street or park tree in Florida. His wild Bogota strawberry, *Fragaria vesca* (No. 51564), may be valuable for breeding purposes; his chocho, *Lupinus cruckshanksii* (No. 51566), a 6-foot treelike lupine with varicolored flowers, is well worth growing, he believes. His two rare species of Tacsonia, *T. manicata* (No. 51567) and *T. pinnatistipula* (No. 51568), will add new material for the breeding of this neglected group of fruting vines; and the wild blackberry, *Rubus bogotensis* (No. 51569), from the sabana of Bogota, may be useful for breeding purposes.

Descriptions of the valuable plants collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture attached to the Smithsonian expedition, in his explorations in East Africa, continue to appear. Among them are many valuable things, including the doum palm, *Hyphaene thebaica* (No. 51440), distinguished as the only branching palm known. This species thrives in southern Florida and, since it is a beautiful landscape species, deserves to be widely planted there. A juniper, *Juniperus procera* (No. 51442), from the escarpment above the Rift Valley; a large, coarse grass, *Panicum quadrifarium* (No. 51446), from the banks of the Uaso Nyiro River; the beautiful liano (No. 51461), with clusters of deep reddish colored fruit, from the high forest region near Meru; a desert grass, *Cenchrus* sp. (No. 51488), with burlike seed, possibly valuable for our desert country; a Cotoneaster, *C. simonsi* (No. 51493), used for hedges in Nairobi; a large wild olive, *Olea chrysophylla* (No. 51519), from the highlands; a wild blackberry, *Rubus* sp. (No. 51535), of good flavor; a wild red raspberry, *Rubus* sp. (No. 51536), the Telfaria, *T. pedata* (No. 51542), a remarkable cucurbit bearing immense fruits which are filled with large edible seeds the size of a large almond; a new clover, *Trifolium* sp. (No. 51543), from Kenia Province; and *Trifolium tembense* (No. 51545) from the uplands of the same province, which thrives in very wet soil, are among the host of interesting things found by him. The extensive collections made during the last part of his African trip and including his stay in Uganda and the Anglo-Egyptian Sudan are comprised in his descriptions for Nos. 51898 to 52267. His collection of sorghums, beans, forage grasses, millets, cucumbers, cotton, etc., includes wild-growing forms as well as those cultivated by the agricultural tribes through whose land he traveled and can not fail to be of real value to the many research workers who are studying these important staple crops and are hunting for new characters to incorporate into our own highly developed varieties.

Doctor Shantz traveled more than 9,000 miles through the eastern portion of Africa from Cape Colony through to Egypt, and his more than 1,500 collections made through this vast territory and noted in this and the four preceding inventories include many introductions of great potential value for American agriculture. A map (Fig. 1) has been prepared, showing the region covered by his explorations.

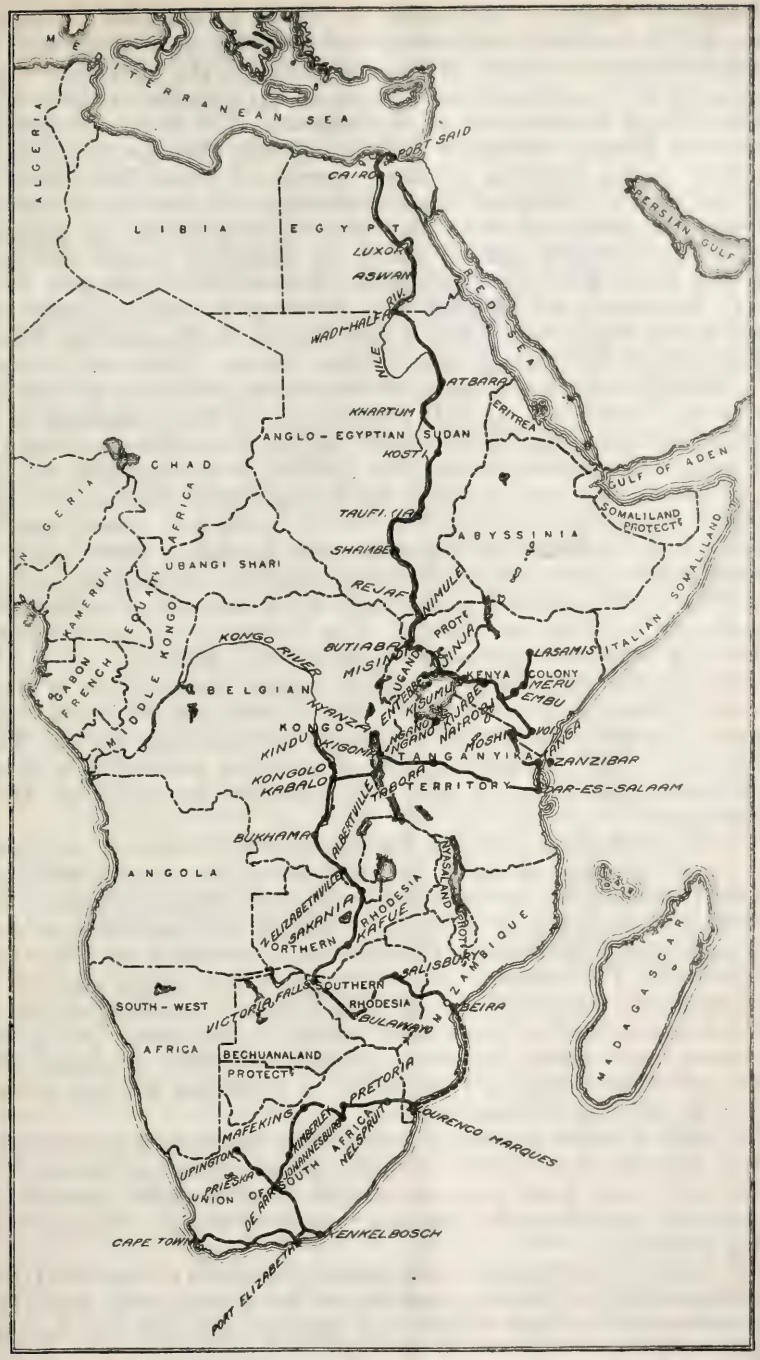


FIG. 1.—Map of South and East Africa, showing the route taken by Dr. H. L. Shantz in his Cape-to-Cairo agricultural exploration trip during the years 1919 and 1920.

Joseph F. Rock, a contributor to these inventories for several years and at one time a collaborator of the Office of Foreign Seed and Plant Introduction while collecting in India, in this inventory begins to describe his first collections made as an agricultural explorer of the United States Department of Agriculture. His first expedition to Siam and Burma was made for the special purpose of procuring authentic living material of those species of forest trees from the seeds of which is obtained the chaulmoogra oil used in the cure of leprosy. In connection with his main object he picked up a number of new and valuable plants, which are described in this inventory. The goa bean, *Botor tetragonoloba* (No. 51765), cultivated in the Malay Peninsula, he declares is a delicious vegetable, better than green string beans, and since it has fruited in Brooksville, Fla., it deserves study by truck growers in the South. *Coleus rotundifolius* (No. 51768), a species of mint, he reports is grown for its tubers in the Malay Peninsula. It will produce tubers from cuttings in five months, but when planted as tubers refuses to produce new ones the first year. *Flacourtia rukam* (No. 51772), from Bangkok, he finds is a handsome new fruiting tree, producing fruits the size of a large cherry. *Mangifera odorata* (No. 51774), with very strong-smelling fruits, which he found at Bangkok, may furnish a better stock for the mango than the mango seedlings themselves. *Artocarpus champeden* (No. 51804), related to the jack fruit, according to Mr. Rock is preferred to it by the Malays. The Siamese chaulmoogra tree is specifically *Hydnocarpus anthelminthica* (No. 51773.)

From the Belgian Kongo, Father Vanderyst sends in a native legume, *Sphenostylis stenocarpa* (No. 51365), which forms edible tubers and is cultivated by the natives of German East Africa. These tubers have a flavor similar to that of potatoes, according to Doctor Zimmermann, the botanist who was stationed for years on Mount Kilimanjaro.

Populus charkowiensis (No. 51381), said to be one of the fastest growing of all poplars and a hybrid between the pyramidal poplar and the black poplar, has been procured from Orleans, France.

Fresh cassava roots as a starchy vegetable are beginning to make their appearance in southern Florida, but as yet their use is too little appreciated. The cassava is an enormous food producer and has the advantage over corn that its roots store themselves, so to speak, in the soil and do not need to be gathered at any definite time. Mr. Krauss has shown how certain Hawaiian varieties, *Manihot esculenta* (Nos. 51358 and 51359), respond remarkably to fertilizers and can be made to yield as much as 10 tons an acre.

The tulda bamboo has been so successful wherever it has grown in central Florida that another Bengal species, *Bambos balcooa* (No. 51361), said to be taller even and stouter than the tulda, should have an unusual interest to the growing group of people who are cultivating bamboos.

A tropical plum, *Prunus bokhariensis* (No. 51743), from the United Provinces of India, which, according to Mr. Rockey, who sends it, is a sweet-fruited variety, might have great value for the Southern States.

From Darwin, Northern Territory, Australia, Mr. Allen sends in *Andropogon bombycinus* (No. 51792), a species which grows in drifting sands and will endure much heat and drought.

The guar of India ought to be given unusual attention, and four new varieties, *Cyamopsis tetragonoloba* (Nos. 51598 to 59601), used as a vegetable, should be thoroughly tried because of the drought resistance of the species.

Vitex cuneata (No. 51604), with leaves larger than the horse-chestnut and large, highly scented flowers, may prove valuable as a shade tree in the South.

Ribes longeracemosum (No. 51617), from the mountains of western China, bears large black fruits in racemes 1½ feet long, and ought to be useful to plant breeders. If it proves resistant to the white-pine blister rust, for which black currants generally are hosts, it might be the beginning point of a race of long-clustered black currants.

Doctor Pittier has sent in a new cultivated fruit tree, the guayabo pesjua (No. 51626), an undescribed Myrciaria, which bears fruits that are favorites among the Venezuelans and should have a chance of succeeding in Florida.

Cuttings of *Pyrus malifolia* (No. 51702) have been procured from the Museum of Natural History in Paris. This is a supposed hybrid with leaves resembling those of the apple.

The guisquil de papa, *Chayota edulis* (No. 51704), is a perfectly smooth skinned white chayote, which when cooked is unusually mealy in texture and reported to be of a better flavor than the common kind. It should be widely tested wherever the chayote will grow.

Leonard Coates, of Morgan Hill, Calif., has been using the seeds of a hybrid peach-almond (No. 51705) as a stock and strongly recommends it as making double the growth of the ordinary peach.

The director of the plant-breeding station in Buitenzorg, Java, has sent a remarkable collection of palm seeds (Nos. 51707 to 51726 and 51733 to 51739) and seeds of screw pines or *Pandanus* (Nos. 51727 to 51732) for trial in Florida, where both palms and screw pines thrive remarkably well and are beginning to be of very great landscape importance.

The Turkish hazel, *Corylus colurna* (Nos. 51779 and 51780), of which Mr. Dunbar has a beautiful specimen in the park in Rochester, N. Y., unlike our hazel, is a good-sized tree, attaining when mature 60 feet in height. Its nuts, although smaller than the cobnut or commercial filbert, compare favorably with the wild American hazelnuts. This hazel will probably make a good nut tree for roadside planting in the Northern States.

The *Mimusops kauki* (No. 51820), which grows on the islands scattered around the Straits Settlements region, bears fruits resembling dates in shape which are of unusual value to the natives, who dry them and keep them for seasons of scarcity. Perhaps it would grow on the Florida keys.

The guada, *Trichosanthes anguina* (Nos. 51824 to 51827), is a rapid-growing cucurbit from the Solomon Islands which within a few months from the time of planting produces as much as 25 pounds of fruit. These are 3 to 6 feet long, range from orange to green in color, and weigh as much as 2 pounds apiece. When sliced and served with a French dressing they are said to be quite a luxury. They may serve as a substitute for cucumbers in the South.

Thomas Brown, of Egypt, sends a remarkable collection of *Crotalarias* (Nos. 51832 to 51842), promising cover crops and humus-producing plants, for trial in California and Florida.

The Madrid Botanic Garden has furnished a valuable collection of the forage legume, lotus, embracing 14 species (Nos. 51856 to 51869) collected in Europe and Africa.

Through John Dunbar, of Rochester, N. Y., we have received for propagation material of what is probably the most satisfactory of all the poplars and one of the few large-leaved exotic trees that can be recommended for general planting in the Northern States, *Populus maximowiczii* (No. 51877). It grows 3 to 5 feet a year for the first eight years under conditions where the Norway maple will grow only 6 to 24 inches and the red and pin oak 12 to 30 inches. A tree at the Arnold Arboretum is now 20 years old and 35 feet tall.

There is a variety of sulla, *Hedysarum coronarium* (Nos. 51888 and 51889), occurring on the little island of Gozo (one of the Malta group), which matures earlier than the ordinary sort of this remarkable forage crop: it seems worth testing in the South where the ordinary sulla has not been a success, since it is caught by the fall frosts.

Paulownia fortunei (No. 52268), a Formosan flowering tree related to *Paulownia imperialis* but with whitish spotted flowers, has wintered in Washington successfully. Possibly it will prove a desirable ornamental park tree for the Southern States.

A. C. Hartless, of Seharunpur, sends in seeds of a tree of the caper family, *Crataeva religiosa* (No. 52286), the fruits of which are mixed with mortar to form strong cement. Just how it increases the strength of the cement is not clear.

To those interested in tropical persimmons, *Diospyros peregrina* (No. 52288), with fruits 2 inches across, may be useful.

The botanical determinations of seeds introduced have been made and the botanical nomenclature revised by H. C. Skeels, and the descriptive and botanical notes arranged by G. P. Van Eseltine, who has had general supervision of this inventory. The manuscript of this inventory has been prepared by Miss Esther A. Celander and Miss Patty T. Newbold.

DAVID FAIRCHILD,
Agricultural Explorer in Charge.

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION,
Washington, D. C., March 18, 1922.

INVENTORY.[1]

51358 to 51360. MANIHOT ESCULENTA Crantz. Euphorbiaceæ.
(*M. utilissima* Pohl.) **Cassava.**

From Haiku, Maui County, Hawaii. Cuttings presented by F. G. Krauss, superintendent of agricultural extension, Hawaii Agricultural Experiment Station, through J. M. Westgate, agronomist in charge, Honolulu. Received October 1, 1920. Quoted notes by Mr. Krauss.

"The cassava was grown on rough pineapple land, without fertilization and little or no cultivation (aside from the initial plowing under of the old pineapple stumps and one cross-plowing) to test its adaptability as a rotation crop. Harvested at the end of 15 months, on June 15, at the Haiku substation for the first test and at the close of a growing period of 18 months on four one-sixth-acre plats for the second test."

51358. "*Sweet white* (early maturing) culinary variety. First test: Clean roots per acre, 3,360 pounds. Second test: Check rows (no treatment), average of four plats, roots per acre, 3,129 pounds. Fertilized with 500 pounds of phosphates (half super and half reverted), average of four plats, roots per acre, 6,258 pounds. Fertilized with 1,000 pounds of phosphates (half super and half reverted), roots per acre, 7,712 pounds."

51359. "*Bitter red* (late maturing) stock-feed variety. First test: Clean roots per acre, 24,360 pounds. Second test: Check rows (no treatment), average of four plats, roots per acre, 10,918 pounds. Fertilized with 500 pounds of phosphates (half super and half reverted), average of four plats, roots per acre, 17,976 pounds. Fertilized with 1,000 pounds of phosphates (half super and half reverted), average of four plats, roots per acre, 20,962 pounds. Starch recovered, 18 per cent."

51360. "*Martin's Intermediate* variety. First test: Clean roots per acre, 7,014 pounds. Second test: Check rows (on treatment), average of four plats, roots per acre, 4,326. Fertilized with 500 pounds of phosphates (half super and half reverted), average of four plats, roots per acre, 6,920 pounds. Fertilized with 1,000 pounds of phosphates (half super and half reverted), average of four plats, roots per acre, 11,802 pounds."

51361. BAMBOS BALCOOA Roxb. Poaceæ. **Bamboo.**

From Lucknow, Oudh, India. Seeds presented by H. J. Davies, superintendent, Government Horticultural Gardens, through W. Bembower, Allahabad Agricultural Institute. Received October 1, 1920.

The large and characteristic bamboo of the Bengal villages, native to the plains of the eastern side of India, extending from Bengal into Assam and Cachar. It differs chiefly from *Bambos tulda* in its larger leaves, which are not pubescent

[1] It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in these inventories are those which the material bore when received by the Office of Foreign Seed and Plant Introduction and, further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in these inventories will in many cases undoubtedly be changed by the specialists interested in the various groups of plants and the forms of the names brought into harmony with recognized American codes of nomenclature.

and are possessed of distinct transverse veins. The joints of the rachis are short and glabrous. The plant has stems often 50 to 70 feet in height, stouter and taller than in *B. tulda*. *B. balcooa* is the best Bengal species for building, scaffolding, and other works which require both size and strength. Long immersion in water tends to make the timber firmer and proof against the attacks of the Bostrychus borer. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 39.*)

51362. HYDNOCARPUS WIGHTIANA Blume. Flacourtiaceæ.

From Calcutta, India. Seeds presented by Harold R. Foss, American consul in charge. Received October 4, 1920.

A common tree of the western peninsula from the Konkan along the coast ranges of India. The seeds yield by expression, or by boiling in water, about 44 per cent of a tasteless, odorless, sherry-yellow oil which is chiefly used as a lamp oil in Goa. The seed has long been employed by the natives of the western coast ranges as a domestic remedy in cases of skin disease and as a dressing for wounds and ulcers. The oil is now used as an ingredient in a mixture for similar uses. Used internally in doses of 15 minims to 2 drachms, the oil has given satisfactory results as a substitute for the more expensive chaulmoogra oil in the treatment of leprosy. It is also used in the same way to treat secondary syphilis and chronic rheumatism. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 4, p. 308.*)

51363. ALLIUM SATIVUM L. Liliaceæ. **Garlic.**

From Shanghai, China. Sets presented by D. MacGregor, Superintendent of Parks, through Edwin S. Cunningham, American consul general. Received October 5, 1920.

"Sets of the best commercial varieties of garlic." (*Cunningham.*)

51364 and 51365.

From Kisantu, Belgian Kongo. Presented by Father Hyacinthe Vanderyst. Received October 7, 1920.

51364. CACARA EROSA (L.) Kuntze. Fabaceæ. Yam bean.
(*Pachyrhizus angulatus* Rich.)

"A twining, wiry stemmed plant with large tuberous roots, occasionally grown in the West Indies. It has also been tested in Florida and has proved to be quite successful at Miami. Its roots, which are sometimes very large, contain much starch." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 47146.

51365. SPHENOSTYLIS STENOCARPA (Hochst.) Harms. Fabaceæ.

"This legume forms edible tubers and is cultivated by the natives in German East Africa. The flavor of these tubers is similar to that of potatoes." (*Dr. A. Zimmermann.*)

For previous introduction, see S. P. I. No. 31194.

51366. ARALIA CACHEMIRICA Decaisne. Araliaceæ.

From Rochester, N. Y. Plants presented by John Dunbar, assistant superintendent, Department of Parks. Received October 8, 1920.

This close relative of the udo (*Aralia cordata*) is found in temperate regions of the Himalayas in Sikkim and Kashmir, India, where it forms a lax shrub 5 to 10 feet in height. The leaflets of this species are said to have hairy upper surfaces, while those of the udo are glabrous. Also, the leaves of this species are quinately compound, while those of the udo are ternately or quinately decompound. The umbels of flowers are borne in panicles up to a foot in length. (Adapted from *Hooker, Flora of British India, vol. 2, p. 722.* and *Bailey, Standard Cyclopedia of Horticulture, vol. 1, p. 344.*)

51367. CARICA PAPAYA L. Papayaceæ. **Papaya.**

From Swatow, Kwangtung, China. Seeds presented by Arthur H. Page. Received October 8, 1920.

"I am sending you a few seeds of my commonest papayas." (*Page.*)

For previous introduction, see S. P. I. No. 47586.

51368 to 51370.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received October 15, 1920. Quoted notes by Doctor Proschowsky.

51368. ASCLEPIAS CURASSAVICA L. Asclepiadaceæ. Milkweed.

"A small shrub with showy orange flowers, hardy here."

A subtropical perennial, native to the West Indies, with stems 2 or 3 feet in height and deep-green lanceolate leaves. The scarlet and saffron colored flowers are borne in upright umbels. (Adapted from *Edward's Botanical Register, vol. 1, pl. 81.*)

51369. EUPATORIUM sp. Asteraceæ.

"A large bush or small tree bearing feathery white flowers in great abundance nearly the whole year."

Received as *E. morrisii* Vis., a name which first appeared in a garden list without description. Apparently a description of the plant has never been published.

51370. MIMOSA GLOMERATA Forsk. Mimosaceæ.

"A perennial herbaceous plant whose stems die down in winter. It develops long, leafy shoots in spring, of which farm animals are very fond. It is quite spineless and very drought resistant, having a long taproot, so that it may be of value as a forage plant for dry climates."

For previous introduction, see S. P. I. 34044.

51371 to 51373. CYAMOPSIS TETRAGONOLOBA (L.) Taub. Fabaceæ. (*C. psoraloides* DC.) Guar.

From Poona, Bombay Presidency, India. Seeds presented by Dr. William Burns, economic botanist, Poona Agricultural College. Received October 15, 1920.

"An erect East Indian leguminous annual with long, straight stems bearing an enormous number of pods, each containing about seven pale, angular seeds. The plant grows 3 to 6 feet in height and in India is cultivated both for green forage and for the seed, which is used mainly for feeding cattle but also for human food. Guar may be grown anywhere in this country where cowpeas succeed and is more drought resistant than any other annual legume. It may be utilized as hay, pasturage, or silage." (*C. V. Piper.*)

The following varieties were received:

51371. *Pardeshi.*

51372. *Makhaniya.*

51373. *Sotiya.*

For previous introduction, see S. P. I. No. 49902.

51374 to 51376.

From Medellin, Colombia. Seeds presented by W. O. Wolcott. Received October 19, 1920.

51374. ANNONA MURICATA L. Annonaceæ. Soursop.

"The soursop, known in Spanish-speaking countries as the guanábana, is unexcelled for sherbets and refreshing drinks. The fruit is oblong, sometimes weighs 4 or 5 pounds, and has white flesh with a rich, aromatic flavor. The tree is tropical in its requirements and in the United States can be grown only in the southern part of Florida." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 47874.

51375 and 51376. RICINUS COMMUNIS L. Euphorbiaceæ. Castor-bean.

"I have a new kind of castor-bean which is twice the size of the ordinary kind; it is like a large Lima bean and is said to yield more oil than the ordinary bean." (*Wolcott.*)

51375. A. Seeds light gray overlaid with red markings.

51376. B. Seeds light gray overlaid with dark-brown markings.

51377 and 51378. ANANAS SATIVUS Schult. f. Bromeliaceæ. **Pineapple.**

From Pago Pago, American Samoa. Offshoots presented by Hon. Warren J. Terhune, governor. Received October 20, 1920.

"Offshoots of a very fine variety of Samoan pineapple." (*L. W. Cartwright, private secretary to the governor.*)

51379. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Sydney, New South Wales. Seeds presented by George Valder, undersecretary and director, Department of Agriculture. Received October 20, 1920.

Seeds of locally grown timothy, introduced for the use of the Office of Forage-Crop Investigations.

"Grows on poor sandy soil; harvested in January, 1920." (*Valder.*)

51380. PYRUS sp. Malaceæ. **Pear.**

From Chico, Calif. Seeds collected by Galloway, Wight, and Allanson at the Plant Introduction Field Station. Received October 4, 1920.

These were removed from a collection of 125 different pears, mostly of Chinese varieties or hybrids, which were sent to Washington from Chico station. The seeds are to be planted and grown for the purpose of producing material of possible value as natural hybrids; also material for breeding purposes and for stock.

51381. POPULUS CHARKOWIENSIS Schroed. Salicaceæ. **Poplar.**

From Orleans, France. Cuttings purchased from Léon Chenault & Son. Received November 29, 1920.

This is said to be the fastest growing poplar known; it is very hardy and has very light wood. It is considered a hybrid between *P. pyramidalis* and *P. nigra*. (Adapted from *Mitteilungen der Deutschen Dendrologischen Gesellschaft, No. 28, p. 143.*)

51382 to 51386. AVENA SATIVA L. Poaceæ. **Oats.**

From Madrid, Spain. Seeds presented by Guillermo Quintanilla, director, Escuela Especial de Ingenieros Agronomos, through Ely E. Palmer, American consul. Received November 23, 1920. Quoted notes by Sr. Quintanilla.

51382. "*Adancro*, from Avila Province."

51383. "*Avena gris*, from Soria Province."

51384. "*Palacios de Goda*, from Avila Province."

51385. "*Avena blanca*, from Soria Province."

51386. "*Flores de Avila*, from Avila Province."

51387. COLOCASIA ESCULENTA (L.) Schott. Araceæ. **Taro.**

From Yencheng, Kiangsu, China. Tubers presented by Rev. Hugh W. White, American Presbyterian Mission, South. Received December 10, 1920.

"This community is using the taro largely as a food article, answering somewhat to our potato, and we ourselves have discovered a method of preparation which makes it a most palatable dish." (*White.*)

"The tubers of this variety when cooked by boiling (early in December) were very moist and rather lacking in flavor, but the texture was smooth and other methods of preparation should make it more agreeable to the American palate. Judging from an earlier introduction [S. P. I. No. 34520] of this taro, the corm is mealy and otherwise of good quality." (*R. A. Young.*)

51388. XANTHOSOMA SAGITTAEFOLIUM (L.) Schott. Araceæ.

Yautia.

From Coban, Alta Vera Paz, Guatemala. Tubers presented by Harry Johnson. Received October 12, 1920.

"The *Kcsh-camote*, purchased in the market place, Coban. These appear to be very good examples of the common variety seen about here. Those grown at Chama are as a rule smaller. They are usually sold boiled and peeled, to be eaten out of hand, by the Indians. The custom of cooking the various native vegetables and selling them by portion is evidently an old one, as it is everywhere apparent." (*Johnson.*)

"The tuber of the *Kcsh-camote* received is a white-fleshed yautia of very good quality. It is short and thick and about 5 ounces in weight." (*R. A. Young.*)

51389 to 51395.

From Bogota, Colombia. Seeds collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received October 13, 1920. Quoted notes by Mr. Popenoe.

51389. CARICA CANDAMARCENSIS Hook. f. Papayaceæ.

"(No. 456a. September 20, 1920.) *Papaya.* Evidently this hardy species, which is common in gardens on the mesa or plateau of Bogota, goes by the same name as the papaya of the lowlands, the true *Carica papaya*, although the two species are quite distinct in the character of their fruit.

"*Carica candamarcensis* is sufficiently hardy to be grown in many parts of southern California, and I believe it worth establishing in that State. I have grown it myself at Altadena, but unfortunately the plants were all of one sex, and I never had any fruit.

"In general appearance the species greatly resembles *C. papaya*, except that it is somewhat smaller in its leaves and fruits. It grows to about 20 feet in height. The fruits are the size of a large lemon, or about 4 inches long, elliptic in form and deeply ribbed. They are deep yellow or orange when ripe and very aromatic—quite a contrast in this respect to the true papaya. The flesh is scarcely half an inch thick, and the seed cavity is filled with seeds and the arils which surround them. The fruit is not eaten out of hand but is cooked in sirup, to make a very good dulce."

For previous introduction, see S. P. I. No. 49473.

A fruiting tree of this species is shown in Plate I.

51390. CYCLANTHERA PEDATA (L.) Schrad. Cucurbitaceæ.

"(No. 458a. September 20, 1920.) A cucurbit commonly sold in the market of Bogota and falsely called *pepino* (cucumber), since it is not eaten as a salad, like the cucumber, but is served relleno or stuffed with forcemeat and baked, as are sweet peppers in the North. It is long and slender, tapering to a point at the apex; about 5 inches long, light green, with a hollow cavity in the center."

For previous introduction, see S. P. I. No. 29330.

Fruits of this vine are shown in Plate II.

51391. LAVATERA ASSURGENTIFLORA Kellogg. Malvaceæ.

"(No. 455a. September 20, 1920.) *Malvisco.* A malvaceous shrub cultivated in dooryards at Nemocon, north of Bogota, at an altitude of about 8,600 feet. The plant reaches about 8 feet in height, is half woody and bushy in habit. The flowers are about 2 inches broad, somewhat like hollyhocks in form, and purplish red."

51392. TACSONIA sp. Passifloraceæ.

"(No. 461a. September 20, 1920.) *Curuba.* This is a somewhat rare species with red fruits (wherein it differs from the common *curuba* of this region). Also, I believe the plant is somewhat more decorative than the common species, the flowers being of a livelier shade of pink.

51389 to 51395—Continued.

The fruits are 2 to 4 inches long, somewhat more slender toward the base than near the apex, and greenish crimson when ripe. In quality they are perhaps not so good as those of the common *curuba* or *curuba de Castilla*. The plant is a climber, reaching, perhaps, 15 or 20 feet."

For previous introduction, see S. P. I. No. 42032.

51393. PRUNUS SEROTINA Ehrh. Amygdalaceæ. **Capulin.**

"(No. 460a. September 20, 1920.) *Cereza*. The wild cherry of the Andes, which appears to be about the same as the cereza of Guatemala and southern Mexico. The tree, which is common on the plateau of Bogota, grows to about 40 feet in height and is stout. The leaves are long and slender, and the white flowers are borne in racemes up to 6 inches long. The fruits are half an inch or more in diameter, oblate, dark maroon, and of pleasant but not pronounced flavor."

For previous introduction, see S. P. I. 44885.

51394. SOLANUM QUITOENSE Lam. Solanaceæ. **Naranjilla.**

"(No. 459a. September 20, 1920.) *Lulu*. A solanaceous plant, probably a shrub, bearing broadly ovoid to round, bright-orange fruits about 2 inches in diameter. These have a leathery skin, inclosing peculiarly translucent greenish flesh and many small flattened seeds. The flavor is subacid and somewhat aromatic; the fruit is used to make a refreshing drink, or it is sometimes eaten out of hand."

For previous introduction, see S. P. I. No. 47951.

51395. DESFONTAINEA SPLENDENS Humb. and Bonpl. Loganiaceæ.

"(No. 462a. September 20, 1920.) A shrub from the mountains above Fusagasuga, at 9,400 feet altitude. It is broad and compact in habit, reaching to about 5 feet in height. Its leaves resemble those of the holly in form and character, but are of a lighter shade of green. The flowers are tubular, about an inch long, red below and yellow at the mouth. The plant is an attractive one, and is recommended for trial as an ornamental."

51396 to 51403.

From Bogota, Colombia. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received October 4, 1920. Quoted notes by Mr. Popenoe.

51396. CAPSICUM ANNUUM L. Solanaceæ. **Pepper.**

"(No. 450a. September 11, 1920.) Seeds of *aji*, a yellow pepper from the Bogota market. It is somewhat conical in form, about 2 inches long, rich glossy yellow, and has fairly thick flesh. It is not so piquant as the small chilies, but more so than the sweet peppers."

51397. OXALIS TUBEROSA Molina. Oxalidaceæ.

"(No. 447. September 11, 1920.) Tubers of *hibia*, one of the favorite root crops of the Indians, by whom it has been cultivated since pre-Columbian times. It has the disadvantage (for the North) that it requires nearly a year to reach maturity, and as it is not very hardy, it will probably not be possible to cultivate it in the northern United States. It likes a cool climate, soft rich soil, and abundant moisture."

For previous introduction, see S. P. I. No. 46659.

51398. PASSIFLORA LIGULARIS Juss. Passifloraceæ. **Sweet granadilla.**

"(No. 452a. September 11, 1920.) Seeds of the *granadilla*, commonly cultivated in the highlands of Cundinamarca up to 6,500 feet altitude. The fruit is oval to nearly round, nearly 3 inches long, brown, and somewhat spotted on the surface, with a brittle shell inclosing flattened black seeds surrounded by translucent, juicy, whitish pulp of pleasant, subacid, slightly aromatic flavor. It is perhaps not quite so good as the *granadilla* of Guatemala."

For previous introduction, see S. P. I. No. 49146.

51399. TACSONIA MOLLISSIMA H. B. K.

"(No. 449a. September 11, 1920.) Seeds of the *curuba*, or *curuba de Castilla*. This species is more commonly cultivated on the mesa of Bogota than any of the several others whose fruits are also known as



THE MOUNTAIN PAPAYA IN FULL BEARING. ((CARICA CANDAMARCENSIS HOOK, F.; S. P. I. No. 51389.)

A few trees of this species have been grown in California, and Mr. Popenoe believes that it is worth establishing in that State. The tree is hardier than the papaya and may serve as a factor in breeding hardier strains of that delicious fruit. The deep-yellow or orange fruits of the mountain papaya are about the size of a large lemon and are very aromatic; cooked in sirup, they make an excellent dulce. (Photographed by Wilson Popenoe, Nemocon, Colombia, September 8, 1920; P18016FS.)



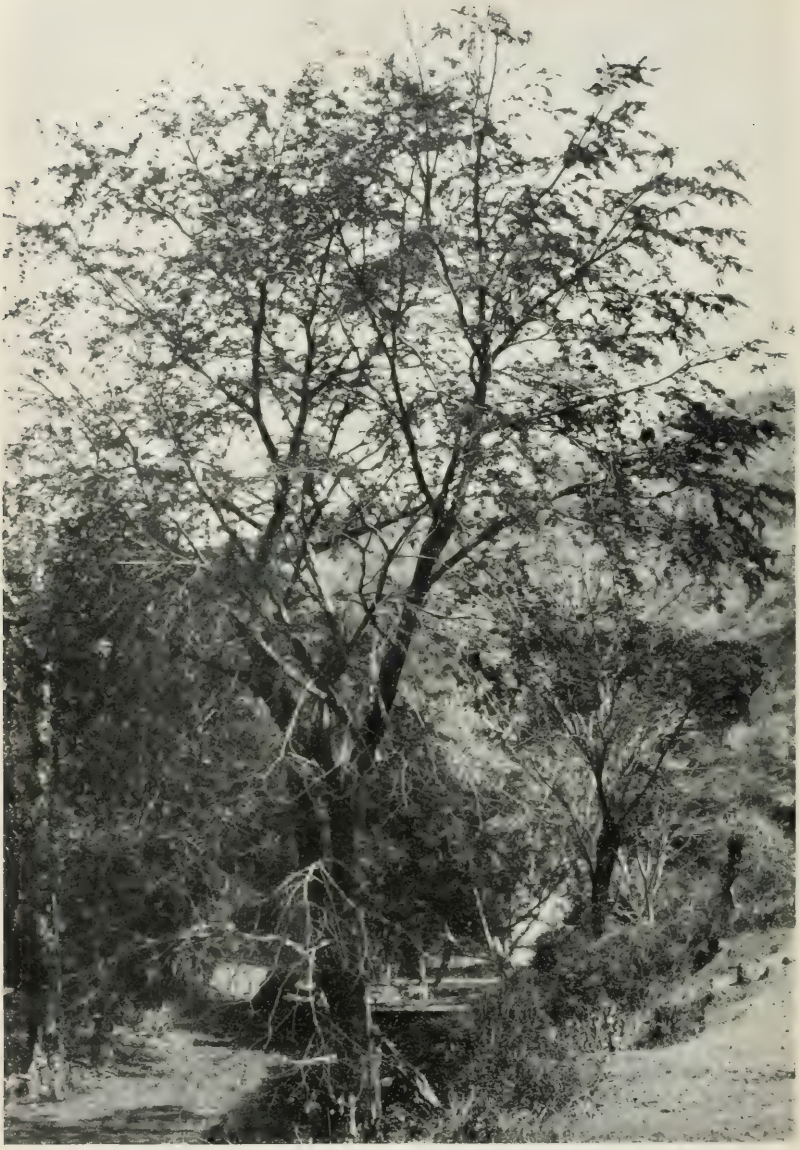
A NEW VEGETABLE FROM COLOMBIA. (CYCLANTHERA PEDATA (L.) SCHRAD.; S. P. I. No. 51390.)

Commonly sold in the markets of Bogota under the misleading name of "pepino," this vegetable, borne on a vine like the cucumber, is said by Mr. Popenoe to be served stuffed with chopped meat and baked, as are sweet peppers in the North. It is not eaten as a salad like the true pepino (*Solanum muricatum*). (Photographed, natural size, by Wilson Popenoe, Bogota, Colombia, August 26, 1920; P18035FS.)



THE GIANT COLOMBIAN BERRY. (RUBUS MACROCARPUS BENTH.; S. P. I. No. 51401.)

These berries, which are here shown natural size, are possibly the largest fruited of all known blackberries; and their introduction by Mr. Popenoe should stimulate work in selecting and crossing to produce, if possible, larger and finer forms of blackberries for American markets. (Photographed by Wilson Popenoe, El Penon, Colombia, October 16, 1920; P18152FS.)



A MAGNIFICENT FLOWERING TREE FROM EASTERN GUATEMALA. (PHYLLOCARPUS SEPTENTRIONALIS DONN.-SMITH; S. P. I. No. 51409.)

This tree, the *flor de mico*, as it is called in Guatemala, may be compared with the royal poinciana when in bloom, though the individual flowers are smaller than in that species. The great masses and deeper scarlet color more than compensate for their smaller size, however; and since the tree is semideciduous at flowering time, the general effect is even more brilliant than that of the poinciana. It flowers in January and February. (Photographed by Wilson Popenoe, El Barranquillo, Guatemala, January 29, 1920; P17718FS.)

51396 to 51403—Continued.

curuba. The vine is not quite so ornamental as that of some other species, but the fruit is considered one of the best. It is slender oblong-oval, 2 to 4 inches long, and slightly more than an inch thick, with a thin, leathery pericarp (not brittle, as in most other species) inclosing many black seeds, each surrounded by an orange-colored, juicy aril. The flavor is sprightly and aromatic. While much eaten out of hand, the fruit is perhaps best when prepared in the form of *creme de curuba* or when made into an ice. Certainly the curuba is one of the most popular fruits in Bogota."

For previous introduction, see S. P. I. No. 43766.

51400. PHYSALIS PERUVIANA L. Solanaceæ. Poha.

"(No. 451a, September 11, 1920.) Seeds of *uchuba*, a form of the ground cherry, or husk cherry, cultivated in the Colombian highlands. The plant reaches about 4 feet in height, and the fruits are oval to nearly round, up to an inch in length, deep yellow when fully ripe, and much esteemed for making dulces, or preserves."

For previous introduction, see S. P. I. No. 48181.

51401. RUBUS MACROCARPUS Benth. Rosaceæ. Colombian berry.

"(No. 446a, September 11, 1920.) Seeds of the *mora*. This is the giant Colombian blackberry, first called to our attention by Frank M. Chapman, of the American Museum of Natural History, and last year introduced into the United States, on a very limited scale, through the efforts of Frederick L. Rockwood, of Bogota. It is a remarkable berry and one which will be of great interest, I believe, to North American horticulturists.

"Frank M. Chapman, M. T. Dawe, and others have spoken of this species as the *mora de Castilla*. This name is, indeed, sometimes applied to it, but it is given to various species of Rubus as well, the term 'de Castilla' being applied to a great many products of the country, signifying that they are of good quality (everything good being supposed to emanate in colonial days from Castile or Spain). Many of the natives with whom I have talked know the species simply as *mora*. Since it is not greatly like our northern berries I suggest that it be called the *Colombian berry* instead of the giant blackberry, thus honoring the land of its origin.

"The species seems limited to regions of very particular climatic conditions; I have seen it only at altitudes of 8,500 to 9,500 feet, in moist mountain meadows on the outer edge of the mesa or plateau of Bogota, where the clouds drift up from the valley and keep the plants bathed almost constantly in mist. It grows among brush and large ferns, its coarse canes reaching to about 10 feet in height and often recurving somewhat. The leaves, which are trifoliolate, are large and coarse. The flowers are produced singly at the ends of stalks 3 to 5 inches long, half a dozen or more of them arising from the summit of a single cane. The flowers are rosy purple and nearly an inch in diameter.

"The berries, which ripen principally from October to December in the region where I have studied the plant (El Penon, between Sibate and Fusagasuga), are variable in form, some being heart shaped and compressed on two sides, others ovoid, and still others oblong. The largest are about 2 inches in length. The individual drupelets are large, and each contains a hard, slender, oblong seed; the torus or receptacle is large and extends well into the center of the fruit; when ripe it separates readily from the drupelets and can be removed before the fruit is eaten. The color of the ripe berry is deep maroon-red. It is juicy and of pleasant flavor, not distinctly resembling the blackberry in this particular. It is used mainly for preserving or making dulces and is frequently seen in the Bogota markets, where it is much in demand and commands a good price."

Plate III shows two fruits (natural size) of this species.

51402. RUBUS sp. Rosaceæ. Blackberry.

"(No. 453a, September 11, 1920.) Seeds of *mora*, a fine large blackberry from the Bogota market. The fruits are 1½ inches long, thick in proportion to their length, and of good flavor and quality. The species grows wild not far from Bogota."

51396 to 51403—Continued.

51403. ULLUCUS TUBEROSUS Caldas. Basellaceæ.

"(No. 448. September 11, 1920.) Tubers of the *chugua.* Like the *hibia* (*Oxalis tuberosa*), the chugua is one of the root crops which has been cultivated by the Indians of the Andes since prehistoric times. The plant is a slender creeper, making stems 2 or 3 feet in length which trail over the ground. It matures in about six months and may be planted (there in Colombia) at any season of the year. The tubers resemble in form small potatoes, but are rosy red or light yellowish green. They are oval and rarely over 3 inches long.

"Like the *hibia* and *cubio,* the chugua is usually eaten after boiling with meat or it forms one of the ingredients of a vegetable stew. It likes a light soil and plenty of moisture."

For previous introduction, see S. P. I. No. 41196.

51404 to 51414.

From the city of Guatemala, Guatemala. Seeds forwarded by H. W. Goforth, American consul, at the request of Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received October 14, 1920. Quoted notes by Mr. Popenoe unless otherwise stated.

51404. ANNONA DIVERSIFOLIA Safford. Annonaceæ. Ilama.

"A small tree with thin, membranaceous foliage and large, conoid, or broadly ovoid fruits about 6 inches long. The edible pulp is cream colored or rose tinted, inclosing hard, smooth, nutlike seeds. The tree is native to southern Mexico and has been introduced into southern Florida." (*W. E. Safford.*)

For previous introduction, see S. P. I. No. 46781.

51405. BYRSONIMA SPICATA (Cav.) DC. Malpighiaceæ.

"*Nance;* flower red and yellow."

51406. ENTEROLOBIUM CYCLOCARPUM (Jacq.) Griseb. Mimosaceæ.

"*Guanacaste;* white flowers."

One of the most beautiful and one of the largest trees of the Pacific region of tropical America, where it grows to an altitude of 900 meters. The trunk sometimes becomes a meter in diameter. The compound leaves close up during the night, and the pods are twisted into a short spiral. The leaves and pods are much relished by cattle. (Adapted from *Pittier, Plantas Usuales de Costa Rica, p. 98.*)

For previous introduction, see S. P. I. No. 44746.

51407. GUAIACUM GUATEMALENSE Planch. Zygophyllaceæ.

"*Guayacan:* purple flowered."

"A small tree, sometimes 30 feet high, with a gnarled and twisted trunk, slender branches, and small, delicate leaves. In February or March the tree comes into flower and is then a mass of lavender purple; it remains in bloom several weeks. The wood is exceedingly hard and is of value for cabinet purposes. The heartwood is a rich brown, while the sapwood is light yellow; both take a fine polish. The tree thrives in a warm climate with little rain."

For previous introduction, see S. P. I. No. 47900.

51408. ZIZIPHUS sp. Rhamnaceæ.

"*Cerezo;* white flowered."

51409. PHYLLOCARPUS SEPTENTRIONALIS Donn.-Smith. Cæsalpiniaceæ.

"*Flor de mico;* red flowers."

"A magnificent flowering tree found in sandy loam in eastern Guatemala, at 1,500 to 2,000 feet altitude. It is of broad, spreading habit 46 or 50 feet high, with light-green compound leaves. In January and February the tree is a mass of crimson-scarlet flowers, which are borne in small clusters and are each about an inch broad."

For previous introduction, see S. P. I. No. 44775.

A tree of this species is shown in Plate IV.

51404 to 51414—Continued.

51410. SAPINDUS SAPONARIA L. Sapindaceæ.

"*Jaboncillo;* white flowers."

51411. (Undetermined.)

"*Chaparron;* yellow flowers."

51412. (Undetermined.)

"*Cabritos;* yellow flowers."

51413. (Undetermined.)

"*Canjuriol;* white flowers."

51414. (Undetermined.)

[No label.]

51415 to 51418.

From Bogota, Colombia. Collected by Wilson Popenoe, Agricultural Explorer of the United States of Department of Agriculture. Received October 27, 1920. Quoted notes by Mr. Popenoe.

51415. HORDEUM DISTICHON NUDUM L. Poaceæ. Naked barley.

"(No. 464a. September 22, 1920.) *Perlada* (pearl) barley, grown upon the mesa, or sabana (plain), of Bogota, at an altitude of approximately 8,500 feet."

For previous introduction, see S. P. I. No. 41162.

51416 and 51417. SOLANUM TUBEROSUM L. Solanaceæ. Potato.

51416. "(No. 465. September 22, 1920.) Tubers of one of the principal varieties sold in the Bogota market. The tubers are compressed or flattened, nearly smooth, and light brown; a good variety."

51417. "(No. 466. September 22, 1920.) Tubers of one of the common potatoes of the Bogota market, and grown nearby in the Andes. The tubers are round, rather irregularly so, as a rule, with shallow eyes and they are mottled dull maroon and whitish brown."

51418. TRITICUM AESTIVUM L. Poaceæ. Common wheat.
(*T. vulgare* Vill.)

"(No. 463a. September 22, 1920.) *Pocho* wheat. A variety cultivated on the mesa (sabana) of Bogota at an altitude of about 8,500 feet."

51419. COLOCASIA ESCULENTA (L.) Schott. Araceæ. Taro.

From Buitenzorg, Java. Tubers presented by Dr. J. C. Koningsberger, director, Botanic Garden. Received November 16, 1920.

"*Talus belang.* A taro having slightly yellowish flesh and a distinctive flavor. The leaf stem is pale green, streaked with bronze; the blade is marbled light and dark green." (*R. A. Young.*)

For previous introduction, see S. P. I. No. 20954.

51420. SORBUS DOMESTICA L. Malaceæ. Service tree.

From Boston, Mass. Seeds seized on board ship by the Federal Horticultural Board. Received October 28, 1920.

Variety *pyriformis.* This variety has pear-shaped fruits about 1¾ inches long and 1½ inches in diameter.

51421 and 51422. CHAYOTA EDULIS Jacq. Cucurbitaceæ.
(*Sechium edule* Swartz.) Chayote.

From Coban, Alta Vera Paz, Guatemala. Fruits presented by Harry Johnson. Received October 5, 1920.

51421. White variety. 51422. Green variety.

"*Perulero.* The green variety is very much scarcer than the white and is perhaps better." (*Johnson.*)

51423. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Copenhagen, Denmark. Seeds presented by Axel Lange, curator, Botanic Garden. Received October 12, 1920.

"These seeds are partly from plants grown in our garden and partly from wild plants." (*Lange.*)

51424. CHAMAEDOREA sp. Phœnicaceæ. **Pacaya.**

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received October 18, 1920.

"Seeds of the *pacaya*." (*Johnson.*)

For previous introduction, see S. P. I. No. 49325.

51425. CANARIUM LUZONICUM (Blume) A. Gray. Balsameaceæ.

From Manila, Philippine Islands. Seeds presented by A. Hernandez, director, Bureau of Agriculture. Received October 18, 1920.

"Seeds of *pisa*. The tree grows wild in the Philippines and is now under cultivation." (*Hernandez.*)

This tree is the source of the brea blanca of commerce. The stone of the fruit contains an oily endosperm which is very palatable.

For previous introduction, see S. P. I. No. 47205.

51426. DIOSCOREA LATIFOLIA Benth. Dioscoreaceæ. **Acom.**

From Nicaragua. Tuber presented by Dr. Luis Sequeira, Bluefields. Received October 19, 1920.

"*Papa cariba*, or 'Carib potato,' which grows wild in this country. The vines bear twice a year, and the tubers are eaten in the same way as the Irish potato. This vine bears from 20 to 50 tubers, chiefly kidney shaped, and weighing from 6 ounces to 1½ pounds." (*Sequeira.*)

This yam appears to be of the same kind as the *caissara*, or "turkey-liver yam," previously received from Brazil. (See S. P. I. No. 47564.) The tubers are aerial.

51427. PISUM SATIVUM L. Fabaceæ. **Garden pea.**

From New York City. Seeds presented by J. W. Pincus. Received October 19, 1920.

"A variety of pea developed by Doctor Mansholt, an excellent breeder, who resides in the Province of Groningen, Netherlands." (*Pincus.*)

51428 to 51463.

From Kenia, Africa. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received September 10, 1920. Quoted notes by Doctor Shantz.

51428. ACACIA sp. Mimosaceæ.

"(No. 1029. Uaso Nyiro River, Kenia Province. June 15, 1920.) A low spreading form, very abundant in desert sections."

51429. CALOTROPIS PROCERA Ait. Asclepiadaceæ.

"(No. 1017. Merile, Nyanza Province. June 30, 1920.) A very large plant with inflated pods 6 inches or more long. It grows along the sandy banks of dry rivers."

51430. CITRULLUS VULGARIS Schrad. Cucurbitaceæ. **Watermelon.**

"(No. 1174. Nairobi, Ukamba Province. July 7, 1920.) The *gosha* melon."

51431. COFFEA sp. Rubiaceæ. **Coffee.**

"(No. 1136. Kabete, Ukamba Province. June 26, 1920.) *Nandi* coffee, a wild coffee from the Nandi forest. It has small branches, much smaller than those of *Blue Mountain*, and a peculiar chicorylike flavor. It can not be pruned to advantage."

51428 to 51463—Continued.

51432. DIGITARIA ABYSSINICA (Hochst.) Stapf. Poaceæ. Grass.

"(No. 1149. Escarpment, Ukamba Province. July 4, 1920.) A very small grass with a habit similar to that of kikuyu grass (*Pennisetum clandestinum*). It is closely grazed by stock."

51433. DOLICHOS LABLAB L. Fabaceæ. Hyacinth bean.

"(No. 987. Meru, Kenia Province. May 21, 1920.) A flat black bean with a large white hilum; obtained in market. This bean is extensively grown by the Kikuyus."

For previous introduction, see S. P. I. No. 47978.

51434. ELICHRYSUM sp. Asteraceæ.

"(No. 1163. Kijabe, Ukamba Province. July 5, 1920.) A small yellow straw flower."

51435. GLADIOLUS sp. Iridaceæ. Gladiolus.

"(No. 1087. Fort Hall, Kenia Province. June 17, 1920.) Has a red flower with yellow on the lower side; the petals are very large at times."

51436. HIBISCUS sp. Malvaceæ.

"Purple or lavender."

Pods of hibiscus included in a shipment sent from Nairobi; without a number or data.

51437. HIBISCUS sp. Malvaceæ.

"(No. 1157. Kijabe, Ukamba Province. July 5, 1920.) A small white-flowered type; an attractive shrub."

51438. HIBISCUS sp. Malvaceæ.

"(No. 1168a. Nairobi, Ukamba Province. July 7, 1920.) From the Botanic Garden; a rather unattractive plant with a large pretty flower."

51439. HOLCUS SORGHUM L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)

"(No. 1098. Fort Hall, Kenia Province. June 17, 1920.) A lot of seed collected between Fort Hall and Nairobi."

51440. HYPHAENE THEBAICA (L.) Mart. Phœnicaceæ. Doum palm.

"(No. 1028. Uaso Nyiro River, Kenia Province. June 15, 1920.)"

The doum palm is distributed from Upper Egypt to Central Africa and is usually not more than 25 feet in height; in old trees the stem is sometimes forked three or four times. The fruits, which are borne in long clusters, from 1 to 200 in a cluster, are yellowish brown and beautifully colored. In East Africa they are eaten by elephants and by natives and whites, especially in times of shortage of other foods. In Upper Egypt they form part of the food of the poorest classes, the part eaten being the fibrous mealy husk, which tastes much like gingerbread but is of a rather dry and husky nature. The hard, tough wood is used for making various domestic utensils. (Adapted from *Lindley and Moore, Treasury of Botany, vol. 2, p. 612.*)

For previous introduction, see S. P. I. No. 47402.

For an illustration showing the doum palm in its native habitat, see Plate V.

51441. INULA sp. Asteraceæ.

"(No. 1166. Kijabe, Ukamba Province. July 5, 1920.) A large blue-flowered plant, reminding one of Centaurea."

51442. JUNIPERUS PROCERA Hochst. Pinaceæ. Juniper.

"(No. 1162. Kijabe, Ukamba Province. July 5, 1920. Herb. No. 880.) A prominent forest tree along the escarpment above the Rift Valley. Probably the Abyssinian juniper."

51443. LINUM USITATISSIMUM L. Linaceæ. Flax.

"(No. 1169. Nairobi, Ukamba Province. July 7, 1920.) *Dutch Child*, imported from Yorkshire; 1919 crop."

51444 and 51445. ORYZA SATIVA L. Poaceæ. Rice.

51444. "(No. 1170. Nairobi, Ukamba Province. July 7, 1920.) Mountain rice, from India."

51445. "(No. 1172. Nairobi, Ukamba Province. July 7, 1920.) Mountain rice (*Mazeras*)."

51428 to 51463—Continued.

51446. PANICUM QUADRIFARIUM Hochst. Poaceæ. **Grass.**

"(No. 1021. Uaso Nyiro River. June 14, 1920.) A large, coarse grass resembling Chaetochloa, abundant along the river bank."

A stoloniferous grass which thrives in marshy places, 1 to 2 meters in height, with dense foliage at the base. (Adapted from *Chiovenda, Etiopia, Osservazione Botaniche, p. 70.*)

51447 and 51448. PENNISETUM GLAUCUM (L.) R. Br. Poaceæ. (*P. typhoideum* Rich.) **Pearl millet.**

51447. "(No. 990. Meru, Kenia Province. May 25, 1920.) One of the most prominent crops of this region; it is flailed and winnowed and constitutes the chief food of the natives."

For previous introduction, see S. P. I. No. 49702.

51448. "(No. 1014. Meru, Kenia Province. June 16, 1920.) The chief crop of this section."

51449 and 51450. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

51449. "(No. 1051. Meru, Kenia Province. June 16, 1920.) A bean with a white stripe, grown by the Kikuyus."

51450. "(No. 1118. Nairobi, Ukamba Province. June 24, 1920.) *Rose-coco* beans from the Kibos Experiment Farm."

51451. PHOENIX RECLINATA Jacq. Phœnicaceæ. **Palm.**

"(No. 1002. Near Meru, Kenia Province. June 12, 1920.) A most attractive palm, growing in the canyons near Meru."

A hardy ornamental palm, not very tall but often reclining. The sweet coating of the drupaceous fruit is edible. This palm is distributed throughout tropical Africa. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 259.*)

For previous introduction, see S. P. I. No. 23424.

51452. PISUM SATIVUM L. Fabaceæ. **Garden pea.**

"(No. 1049. Meru, Kenia Province. June 16, 1920.) Peas from the market; these are grown by the Kikuyus."

51453 and 51454. RICINUS COMMUNIS L. Euphorbiaceæ. **Castor-bean.**

51453. "(No. 989. Meru, Kenia Province. May 25, 1920.) Similar to No. 988 [S. P. I. No. 51532] but larger. This large form is very abundant in the mountain country, where the plants are tree-like, 10 to 15 feet high."

51454. "(No. 1165. Kijabe, Ukamba Province. July 5, 1920.) This was growing wild on the escarpment of the Rift Valley."

51455. SAMANEA SAMAN (Jacq.) Merr. Mimosaceæ. (*Pithecolobium saman* Benth.)

"(No. 1171. Nairobi, Ukamba Province. July 7, 1920.)"

A large spreading tree, 15 to 20 meters high, native to Central America, but widely distributed throughout the Tropics as an ornamental and shade tree; the horizontal branches are extremely long. The wood is not very hard, but the heartwood is of a handsome red color, taking a fine polish. The pods are eagerly eaten by cattle. (Adapted from *Cook and Collins, Economic Plants of Porto Rico, p. 220.*)

For previous introduction, see S. P. I. No. 38654.

51456. SESAMUM ORIENTALE L. Pedaliaceæ. **Sesame.**

"(No. 1173. Nairobi, Ukamba Province. July 7, 1920.) *Black til.*"

51457. VERNONIA sp. Asteraceæ.

"(No. 1151. Kijabe, Ukamba Province. July 5, 1920.) A beautiful Vernonialike bush."

51458 to 51460. ZEA MAYS L. Poaceæ. **Corn.**

51458. "(No. 986. Meru, Kenia Province. May 26, 1920.) Native-grown corn from the market."

51459. "(No. 1086. Fort Hall, Kenia Province. June 17, 1920.) The type grown here in the high country."

51460. "(No. 1139. Kabete, Ukamba Province. June 26, 1920.) A hybrid corn known as 'Fort Hall.'"

51428 to 51463—Continued.

51461. (Undetermined.)

"(No. 996. Near Meru, Kenia Province. June 12, 1920.) *Liano;* beautiful clusters of deep reddish velvetlike fruits about the size of a small grape. This is one of the most showy plants of the high forest region; it is not edible, but is exceptionally ornamental."

51462. (Undetermined.)

"(No. 1013. Meru, Kenia Province. June 15, 1920.) *Maret* (in Somali); a small tree with a yellow sweetish fruit said to be good food. The fruit is about three-eighths of an inch long and roundish."

51463. DISSOTIS EXIMIA (Sond.) Hook. f. Melastomaceæ.

"(No. 1071. En route from Chuka to Embu, Kenia Province. June 16, 1920.) A very attractive plant with purple flowers. It grows well in the bracken area about Kenia."

51464 to 51479.

From Siam and China. Plants presented by G. Weidman Groff. Received October 16, 1920. Quoted notes by Mr. Groff unless otherwise specified.

51464. DURIO ZIBETHINUS Murray. Bombacaceæ. **Durian.**

"Durian seedlings from Siam."

"In the Malay Archipelago where it is native the durian becomes a large tree, with leathery leaves 6 to 7 inches long and oval fruits from 6 to 8 inches in length. The fruit is five valved, and within each compartment are several seeds surrounded by clear, pale-brown, custard-like pulp of strong gaseous odor and rich bland taste. As remarked by Doctor Paludanus: 'The fruit seems at first to smell like rotten onions, but immediately after tasting it is preferred to all other food.' The durian is tropical in its requirements and should be quite at home in many places in the West Indies. It is ordinarily propagated by seeds, although P. J. Wester has shown that it can be budded." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 45179.

51465. GARCINIA MANGOSTANA L. Clusiaceæ. **Mangosteen.**

"Sent from Siam by Dr. Y. S. Sanitwongse."

"This delicious fruit is about the size of a mandarin orange, round and slightly flattened at each end, with a thick, smooth rind, rich red-purple in color, which, when cut out, exposes the white segments lying loose in the cup. The cut surface of the rind is a most delicate pink. The separate segments are whitish and covered with a delicate network of fibers. The texture of the pulp resembles that of the plum, and the flavor is indescribably delicious." (*David Fairchild.*)

For previous introduction, see S. P. I. No. 47120.

51466 to 51472. LITCHI CHINENSIS Sonner. Sapindaceæ. **Lychee.**
(*Nephelium litchi* Cambess.)

"The lychee has been cultivated for at least 2,000 years in southern Asia, where millions are familiar with it. The tree grows ultimately to a height of 35 or 40 feet, forming a broad round-topped crown well supplied with glossy light-green foliage. The fruits, borne in loose clusters of 2 or 3 to 20, have been likened to strawberries in appearance. When ripe they are deep pink, becoming dull brown as the fruit dries. The flavor is subacid, suggestive of the Muscat grape. It should be possible to produce lychees commercially in southwestern Florida, where there is relative freedom from frost and where the soils are deep and moist." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 48214.

51466. "No. 401.6."
51467. "No. 402.8."
51468. "No. 408.7."
51469. "No. 409.4."
51470. "No. 410.6."
51471. "No. 421.6."
51472. "No. 455.1. Mountain lychee seedlings for stock."

51464 to 51479—Continued.

51473. NEPHELIUM LAPPACEUM L. Sapindaceæ. **Rambutan.**

"Rambutan seedlings from Siam."

"The rambutan grows in nearly every garden in Singapore and Penang, and its fruit is one of the most delicious of the region, resembling the lychee in character. The tree becomes 35 or 40 feet high, with compound dark-green leaves, and the fruits, which are produced in clusters of 10 or 12, are oval, about 2 inches long, and covered with soft spines about half an inch long. They are crimson, but sometimes greenish, yellowish, or orange-yellow. The outer covering is easily torn off, exposing the white translucent flesh, which is somewhat acidulous in flavor, suggesting the grape. In climatic requirements the rambutan is strictly tropical." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 47231.

51474. NEPHELIUM sp. Sapindaceæ.

"From Cochin China."

51475. ORYZA SATIVA L. Poaceæ. **Rice.**

"Wild rice from China."

51476 to 51478. PHYLLOSTACHYS PUBESCENS Houzeau. Poaceæ. (*P. mitis* A. and C. Rivière.) **Bamboo.**

"This is the largest hardy species of bamboo in Japan, growing to a height of 50 feet and producing, not uncommonly, culms over 6 inches in diameter. The culms are gently curved shortly after leaving the ground, and the sheaths are light brown, marked with dark umber-brown blotches and round dots and covered with bristles. This is the great edible bamboo of China and Japan." (*David Fairchild.*)

51476. "No. 901. Edible bamboo from China."

51477. "No. 902. Edible bamboo from China."

51478. "No. 903. Edible bamboo from China."

For previous introduction, see S. P. I. No. 47370.

51479. SALAKKA sp. Phœnicaceæ.

"Edible palm from Siam."

51480 to 51482. COFFEA spp. Rubiaceæ. **Coffee.**

From Mayaguez, Porto Rico. Seeds presented by D. W. May, director, Agricultural Experiment Station. Received October 23, 1920.

51480. COFFEA ARABICA L.

"Seeds of Arabian coffee grown in Porto Rico." (*May.*)

51481. COFFEA LAURENTII Wildem. (*C. robusta* Hort.)

A white-flowered shrub, native to Belgian Kongo, with oval dark-green leaves up to a foot in length, and shortly elliptic two-seeded fruits. The roundish seeds are sometimes nearly half an inch long. (Adapted from *Notes du Premier Congrès International de Botanique, 1900, p. 234.*)

51482. COFFEA LIBERICA Bull.

This species is native to West Africa and forms a taller and stronger plant than *C. arabica*, having also larger leaves and berries. It is said to show greater resistance to disease than *C. arabica*. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 2, p. 491.*)

For previous introduction, see S. P. I. No. 31976.

51483 to 51544.

From East Africa. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received September 7, 1920. Numbered October, 1920. Quoted notes by Doctor Shantz.

51483. ABUTILON sp. Malvaceæ.

"(No. 1037. En route from Uaso Nyiro River to Meru, Kenia Province, Kenia. June 15, 1920.) A small yellow-flowered bush resembling a hibiscus."

51483 to 51544—Continued.

51484. ACACIA sp. Mimosaceæ.

"(No. 993. Kauro, Nyanza Province, Kenia. June 11, 1920.) A flat-topped acacia with spiral pods; the principal tree of the lower land and drainage courses."

51485. ACACIA sp. Mimosaceæ.

"(No. 1019. Merile, Nyanza Province, Kenia. June 13, 1920.) A flat-topped acacia with spiral pods; abundant in this desert section."

51486. AESCHYNOMENE TELEKII Schweinf. Fabaceæ.

"(No. 1146. Nairobi, Ukamba Province, Kenia. July 3, 1920.) A very small bush with mimosalike foliage, common in this high country. The pods break up into segments of one seed each."

51487. AMARANTHUS CAUDATUS L. Amaranthaceæ. **Amaranth.**

"(No. 1088. Kagi, between Embu and Fort Hall, Kenia Province, Kenia. June 17, 1920.) An amaranth used like spinach, especially when young."

51488. CENCHRUS sp. Poaceæ. **Grass.**

"(No. 1022. Uaso Nyiro River, Kenia. June 15, 1920.) A desert grass with a burlike seed; may be valuable for our desert country."

51489. GYNANDROPSIS PENTAPHYLLA (L.) DC. Capparidaceæ.

"(No. 1000. Meru, Kenia Province, Kenia. June 12, 1920.) A white cleomelike plant, abundant at Meru, where it grows on the lawn."

51490. COFFEA sp. Rubiaceæ. **Coffee.**

"(No. 1135. Kabete, Ukamba Province, Kenia. June 26, 1920.) A few seeds of *Blue Mountain* coffee, the best type grown here."

51491. COMBRETUM sp. Combretaceæ.

"(No. 1034. En route from Uaso Nyiro River to Meru, Kenia Province, Kenia. June 15, 1920.) From near the river; a true desert tree."

51492. CORIANDRUM SATIVUM L. Apiaceæ. **Coriander.**

"(No. 1115. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Coriander seed from the experimental farm at Kibos."

51493. COTONEASTER SIMONSI Baker. Malaceæ.

"(No. 1142. Nairobi, Ukamba Province, Kenia. July 3, 1920.) This plant forms a beautiful hedge."

For previous introduction, see S. P. I. No. 35128.

51494. CROTALARIA sp. Fabaceæ.

"(No. 1035. En route from Uaso Nyiro River to Meru, Kenia Province, Kenia. June 15, 1920.) A small bush in the grassland."

51495. CROTALARIA sp.

"(No. 1043. Uaso Nyiro River, Kenia. June 25, 1920.) A small yellow-flowered form."

51496. DACTYLOCTENIUM AEGYPTIUM (L.) Richter. Poaceæ. **Grass.**
(*Eleusine aegyptiaca* Desf.)

"(No. 1024. Uaso Nyiro River, Kenia. June 15, 1920.) From Archer's Post (Uaso Nyiro River). Grows near water and also pushes out into the desert."

51497. DOLICHOS LABLAB L. Fabaceæ. **Hyacinth bean.**

"(No. 1050. Meru, Kenia Province, Kenia. June 16, 1920.) Black beans from the market; grown by the Kikuyu natives."

For previous introduction, see S. P. I. No. 47979.

51498. ELEUSINE CORACANA (L.) Gaertn. Poaceæ. **Ragi millet.**

"(No. 1123. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Wimbi from the experimental farm at Kibos."

For previous introduction, see S. P. I. No. 48456.

51499. ERAGROSTIS ABYSSINICA (Jacq.) Schrad. Poaceæ. **Teff.**

"(No. 1128. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Teff from the farm at Kabete."

For previous introduction, see S. P. I. No. 48815.

51483 to 51544—Continued.

51500 and 51501. ERAGROSTIS SUPERBA Peyr. Poaceæ. **Grass.**

51500. "(No. 1030. En route from Uaso Nyiro River to Meru, Kenia Province, Kenia. June 15, 1920.) A grass with broad compressed spikelets, about 3 feet tall. Abundant in the upper grass zone."

For previous introduction, see S. P. I. No. 46806.

51501. "(No. 1099. Fort Hall, Kenia Province, Kenia. June 17, 1920.) A grass with very broad spikes. Abundant in places."

51502. ERIGERON sp. Asteraceæ.

"(No. 1152. Kijabe, Ukamba Province, Kenia. July 5, 1920.) An asterlike perennial which is very attractive and should be useful as a border plant. It resembles *Aster ericoides* but is much taller."

51503. CALLISTEMON CITRINA (Curtis) Skeels. Myrtaceæ.

"(No. 1143. Nairobi, Ukamba Province, Kenia. July 3, 1920.) A common ornamental tree with the habit of a conifer. It holds its seed pods for several years."

51504. GOSSYPIUM sp. Malvaceæ. **Kidney cotton.**

"(No. 1080. En route from Embu to Fort Hall, Kenia Province, Kenia. June 27, 1920.) Seed from a large plant. Cotton is seldom seen in this section."

51505. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"(No. 1138. Kabete, Ukamba Province, Kenia. June 26, 1920.) *Caravonica* cotton from a perennial plant. The bolls resemble somewhat those of Egyptian cotton."

51506. HIBISCUS sp. Malvaceæ.

Three pods, without notes, included with the shipment from Nairobi.

51507. HIBISCUS sp.

"(No. 1089. Fort Hall, Kenia Province, Kenia. June 17, 1920.) Has most attractive small red or vermilion flowers about half an inch in diameter."

51508. HIBISCUS sp.

"(No. 1131. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Collected near Thika; has large, dark-purple flowers."

51509. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

"(No. 1137. Nairobi, Ukamba Province, Kenia. June 24, 1920.) From the farm at Kabete."

51510. IMPATIENS sp. Impatientaceæ.

"(No. 1168. Kijabe, Ukamba Province, Kenia. July 5, 1920.) Wild along the banks of streams."

51511. INDIGOFERA sp. Fabaceæ.

"(No. 1045. Uaso Nyiro River, Kenia. June 25, 1920.) A tall leguminous plant with very small pods."

51512. IPOMOEA sp. Convolvulaceæ. **Morning-glory.**

"(No. 1011. Meru, Kenia Province, Kenia. June 15, 1920.) May be an introduced form."

51513. IPOMOEA HARDWICKII (Spreng.) Hemsl. Convolvulaceæ.
(*I. calycina* Benth.) **Morning-glory.**

"(No. 1052. Meru, Kenia Province, Kenia. June 16, 1920.) Growing on a fence; may be an introduced form."

51514. LEPTOCHLOA sp. Poaceæ. **Grass.**

"(No. 957. Moshi, Tanganyika Territory. April 15, 1920.) A grass which looks soft and palatable. It is one of the first of the native grasses to come into flower."

51515. LINUM USITATISSIMUM L. Linaceæ. **Flax.**

"(No. 1116. Nairobi, Ukamba Province, Kenia. June 24, 1920.) White flax from the experimental farm at Kibos."

51483 to 51544—Continued.

51516. LUPINUS sp. Fabaceæ. **Lupine.**

"(No. 959. Moshi, Tanganyika Territory. April 15, 1920.) An important element of the vegetation; has a large root."

51517. MELOTHRIA sp. Cucurbitaceæ.

"(No. 1039. En route from Uaso Nyiro River to Meru, Kenia Province, Kenia. June 15, 1920.) A small red cucumber, should be similar to No. 436 [S. P. I. No. 49700]."

51518. MUSA ENSETE Gmel. Musaceæ. **Banana.**

"(No. 985. En route from Muzambi to Meru, Kenia Province, Kenia. May 21, 1920.) The most beautiful plant of the mountain ravines."

For previous introduction, see S. P. I. No. 35236.

51519. OLEA CHRYSOPHYLLA Lam. Oleaceæ.

"(No. 1161. Kijabe, Ukamba Province, Kenia. July 5, 1920.) The wild olive of the highlands of East Africa; a rather large tree."

For previous introduction, see S. P. I. No. 42834.

51520 to 51524. ORYZA SATIVA L. Poaceæ. **Rice.**

51520. "(No. 1111. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Variety *M'bale*, from Labaki."

51521. "(No. 1112. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Variety *Kisuke*, from the Charra region."

51522. "(No. 1113. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Variety *Abula*, from the Charra region."

51523. "(No. 1121. Nairobi, Ukamba Province, Kenia. June 24, 1920.) From the experiment station, Kibos."

51524. "(No. 1122. Nairobi, Ukamba Province, Kenia. June 24, 1920.) From the experiment station, Kibos."

51525. PANICUM GEMINATUM Forsk. Poaceæ. **Grass.**

"(No. 1020. Uaso Nyiro River, Kenia. June 14, 1920.) A fine river grass."

51526. PENNISETUM sp. Poaceæ. **Grass.**

"(No. 998 Uaso Nyiro River, Kenia. June 12, 1920.) A plumelike grass very abundant in the desert section, just between the acacia-tall grass and the acacia-short grass region. It is a very promising looking grass."

51527. PENNISETUM sp. Poaceæ. **Grass.**

"(No. 1041. En route from Uaso Nyiro River to Meru, Kenia Province, Kenia. June 15, 1920.) A timothylike grass, rather tall and blanched. An important grass on dark 'cotton' soil."

51528. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

"(No. 1130. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Red beans grown by the natives in the Meru district and sold in the Nairobi market."

51529. CLITORIA TERNATEA L. Fabaceæ.

"(No. 1009. Meru, Kenia Province, Kenia. June 12, 1920.) A small vine with small seeds from the desert near the Uaso Nyiro River."

51530. PHYSALIS PERUVIANA L. Solanaceæ. **Poha.**

"(No. 1132. Nairobi, Ukamba Province, Kenia. June 25, 1920.) The Cape gooseberry, one of the most valuable plants of East Africa and South Africa for making jam; it has a very tart taste."

For previous introduction, see S. P. I. No. 48181.

51531. RHUS sp. Anacardiaceæ.

"(No. 1072. En route from Chuka to Embu, Kenia Province, Kenia. June 16, 1920.) A small tree, very ornamental when heavily loaded with fruits. The fruits are light green, turning red, and resemble chokecherries."

51483 to 51544—Continued.

51532 to 51534. RICINUS COMMUNIS L. Euphorbiaceæ. **Castor-bean.**

51532. "(No. 988. Meru, Kenia Province, Kenia. May 26, 1920.) From the market; used by the Kikuyus to make a red mud paste for hair dressing and for decorating their bodies and clothing."

51533. "(No. 1015. Meru, Kenia Province, Kenia. June 16, 1920.) Castor-beans grown at Meru."

51534. "(No. 1124. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Castor-beans from the experimental farm at Kibos."

51535. RUBUS sp. Rosaceæ. **Blackberry.**

"(No. 1073. En route from Chuka to Embu, Kenia Province, Kenia. June 16, 1920.) The only blackberry seen in Africa. The fruit is a little reddish, but it appears to be a true wild blackberry, with a fairly good flavor."

51536. RUBUS sp. Rosaceæ. **Raspberry.**

"(No. 1100. Fort Hall, Kenia Province, Kenia. June 17, 1920.) A red raspberry of fair flavor."

51537. SENECIO sp. Asteraceæ.

"(No. 1154. Kijabe, Ukamba Province, Kenia. July 5, 1920.) A tall yellow-flowered vine with very fleshy leaves; the vine covers low trees."

51538. SESAMUM ORIENTALE L. Pedaliaceæ. **Sesame.**

"(No. 1117. Nairobi, Ukamba Province, Kenia. June 24, 1920.) *Simsim*. From the experimental farm at Kibos."

51539. SESBAN sp. Fabaceæ.

"(No. 1058. En route from Meru to Embu, Kenia Province, Kenia. June 16, 1920.) A long-podded leguminous plant with the pods and petioles armed with stinging hairs. Seeds very small."

51540. SIDA sp. Malvaceæ.

"(No. 1033. En route from Uaso Nyiro River to Meru, Kenia Province, Kenia. June 15, 1920.) Beautiful white flowers 1½ inches in diameter. The hibiscus and its allies are the most prominent wild flowers of east-central Africa."

51541. SOLANUM WRIGHTII Benth. Solanaceæ.

"(No. 1141. Nairobi, Ukamba Province, Kenia. July 3, 1920.) This species here forms a fine ornamental tree. One tree planted in 1915 is now 15 feet high, with fine clusters of purple flowers, which are very attractive."

51542. TELFAIRIA PEDATA (J. E. Smith) Hook. Cucurbitaceæ.

"(No. 1133. Nairobi, Ukamba Province, Kenia. June 25, 1920.)" A vigorous climbing vine, native to the coast of Zanzibar, which is said to bear an enormous fruit up to 3 feet in length, always green in color. The fruit is divided into five cells, each filled with a dense, fleshy, very oily pulp. This pulp incloses seeds about an inch in diameter, a quarter of an inch thick, and very rich in oil, with a taste something like that of the butternut. The native name in Zanzibar is *koume*. The female flowers are very small, but the male flowers are about 2 inches long and purplish and are borne in racemes. (Adapted from note by Doctor Shantz and from *Curtis's Botanical Magazine, pl. 2751.*)

For previous introduction, see S. P. I. No. 45923.

51543. TRIFOLIUM sp. Fabaceæ. **Clover.**

"(No. 1038. En route from Uaso Nyiro River to Meru, Kenia Province, Kenia. June 15, 1920.) A Trifolium from the Themeda zone below the forest along the stream."

51544. VERNONIA sp. Asteraceæ.

"(No. 1036. En route from Uaso Nyiro River to Meru, Kenia Province, Kenia. June 15, 1920.) A small bush in the grassland below the forest zone."

51545. TRIFOLIUM TEMBENSE Fres. Fabaceæ. **Clover.**

From Kenia. Material collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received October 20, 1920.

"(No. 1175. Near Uplands, Kikuyu, Kenia; altitude 7,678 feet. July 9, 1920.) A clover with small heads; forms large patches in very wet soil." (*Shantz.*)

51546 to 51555.

From Kenia. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received September 7, 1920. Numbered October, 1920. Quoted notes by Doctor Shantz.

51546. (Undetermined.)

"(No. 994. Merile, Nyanza Province, Kenia. June 12, 1920.) One of the principal desert shrubs; about 6 feet high, resembling a buttonbush."

51547. (Undetermined.)

"(No. 1012. Meru, Kenia Province, Kenia. June 15, 1920.) *Myrah* in the Somali language; also called 'Somali food.' A desert shrub 6 to 8 feet high, not spiny, with small leaves. The fruit consists of four orange carpels, each covered with a thin sweet pulp."

51548. (Undetermined.) Fabaceæ.

"(No. 1046. Uaso Nyiro River, Kenia. June 15, 1920.) A leguminous plant with a two-seeded pod."

51549. (Undetermined.) Fabaceæ.

"(No. 1048. Uaso Nyiro River, Kenia. June 15, 1920.) A tall leguminous plant."

51550. (Undetermined.)

"(No. 1059. En route from Meru to Embu, Kenia Province, Kenia. June 16, 1920.) A small upright velvet bean."

51551. CORDIA HOLSTII Gurke. Boraginaceæ.

"(No. 1074. Embu, Kenia Province, Kenia. June 17, 1920.) A catalpalike tree very abundant in this high country, where it is the principal park tree. It is of good shape, with broad leaves, and often covered with very delicate white flowers."

51552. (Undetermined.)

"(No. 1144. Nairobi, Ukamba Province, Kenia. July 3, 1920.) A large evergreen tree with trumpet-shaped upright flowers with five alternate stamens and a purple mottled throat. It bears quantities of fruits filled with seeds."

51553. PENTAS ZANZIBARICA (Klotzsch) Vatke. Rubiaceæ.

"(No. 1147. Escarpment, Ukamba Province, Kenia. July 4, 1920.) A very handsome Senecïolike vine with very fleshy large waxy leaves and a large cluster of yellow flowers."

51554. ERLANGEA MARGINATA (O. and H.) Moore. Asteraceæ.

"(No. 1156. Kijabe, Ukamba Province, Kenia. July 5, 1920.) An especially attractive plant with very large flowers."

51555. (Undetermined.)

"(No. 1167. Kijabe, Ukamba Province, Kenia. July 5, 1920.) Wild along banks of streams."

51556 to 51571.

From Bogota, Colombia. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received November 1, 1920. Quoted notes by Mr. Popenoe.

51556. CEREUS HEXAGONUS (L.) Mill. Cactaceæ. **Cactus.**

"(No. 472. October 8, 1920.) Cuttings of a columnar cactus about 10 feet high, cultivated in a garden at Guaduas, Cundinamarca, at an altitude of about 3,300 feet."

Introduced for the systematic investigations of Dr. J. N. Rose, of the United States National Herbarium.

51556 to 51571—Continued.

51557. CYCLANTHERA PEDATA (L.) Schrad. Cucurbitaceæ.

"(No. 470a. October 8, 1920.) Seeds of a cucurbit commonly sold in the Bogota market."

For previous introduction, see S. P. I. No. 51390.

51558. DURANTA REPENS L. Verbenaceæ.

"(No. 482a. October 8, 1920.) Seeds of a shrub about 10 feet high, common around the edges of the mesa (sabana) of Bogota. It has small graceful racemes of light-blue flowers, followed by large golden berries. It resembles the *Duranta plumieri* cultivated in Florida and California, but apparently has larger fruits."

51559. EPIPHYLLUM OXYPETALUM (DC.) Haw. Cactaceæ. Cactus.

"(No. 474. October 8, 1920.) Cuttings of a shrubby plant of the Phyllocactus type about 8 feet high, cultivated in the patio of the Hotel del Valle, Guaduas, Cundinamarca, at 3,300 feet altitude."

Introduced for the systematic investigations of Dr. J. N. Rose, of the United States National Herbarium.

51560. EPIPHYLLUM PHYLLANTHOIDES (DC.) Sweet. Cactaceæ. Cactus.

"(No. 475. October 8, 1920.) Cuttings of a small plant with slender columnar stems reaching to about 2 feet in height; cultivated as a pot plant in the patio of the Hotel Gonzalez, Facatativa, Cundinamarca, at about 8,600 feet altitude."

Introduced for the systematic investigations of Dr. J. N. Rose, of the United States National Herbarium.

51561. EPIPHYLLUM sp. Cactaceæ. Cactus.

"(No. 471. October 8, 1920.) Cuttings of a broad-stemmed flowering cactus of the Phyllocactus type, cultivated as a pot plant in the Hotel Gonzalez, at Facatativa, at about 8,600 feet altitude."

Introduced for the systematic investigations of Dr. J. N. Rose, of the United States National Herbarium.

51562. EUGENIA sp. Myrtaceæ.

"(No. 479a. October 8, 1920.) Seeds of *arrayan;* many different myrtaceous shrubs are known under this name in tropical America. This particular one grows upon the edge of the sabana, near Facatativa, at altitudes of 8,500 to 9,500 feet. It is an exceedingly handsome arborescent shrub, with deep-green, almost glossy foliage and a great abundance of round fruits not quite half an inch in diameter, which change from green through yellow to orange-scarlet as they ripen. The fruits are edible, but of little value."

51563. FRAGARIA CHILOENSIS (L.) Duchesne. Rosaceæ. Strawberry.

"(No. 467a. October 8, 1920.) Seeds of *fruta de Chile*, often abbreviated to *fruta chil*. This is one of the cultivated strawberries of the Bogota region, quite distinct in character from the common wild strawberry (locally called *Fragaria vesca*).

"The fruit is about an inch long, slender obovate in outline, with rather few and large seeds and light-pink flesh of excellent aroma and flavor. It is a form of rather distinct character and should be of interest to those engaged in strawberry breeding. It may be mentioned that cultivated strawberries are rare in Bogota. I have seen this form only once."

For previous introduction, see S. P. I. No. 46613.

51564. FRAGARIA VESCA L. Rosaceæ. Strawberry.

"(No. 485a. October 8, 1920.) Seeds of *fresa*, the common wild strawberry, found around the edges of the sabana of Bogota, principally at altitudes of 7,000 to 8,000 feet. The fruits are nearly round, rarely over an inch in diameter, with numerous very small seeds. In quality they are fairly good; sometimes they are dry and rather bitter, but ordinarily are juicy and of very pleasant flavor."

For previous introduction, see S. P. I. No. 43997.

51556 to 51571—Continued.

51565. HYLOCEREUS UNDATUS (Haw.) Britt. and Rose. Cactaceæ. Cactus.

"(No. 473. October 8, 1920.) Cuttings of the *pitahaya;* several plants go under this name in Cundinamarca. This one, which comes from La Esperanza, altitude about 4,100 feet, appears to be the commonest species. The fruit is edible and is brought to the Bogota market. The plant was found climbing over a large rock in a coffee plantation."

Introduced for the systematic investigations of Dr. J. N. Rose, of the United States National Herbarium.

51566. LUPINUS CRUCKSHANKSII Hook. Fabaceæ. Lupine.

"(No. 477a. October 8, 1920.) Seeds of *chocho*, from a dooryard on the road between Facatativa and Alban, Cundinamarca, at an altitude of about 8,800 feet. Several species of lupine are known in Cundinamarca under this common name. The one represented by these seeds is a handsome half-woody shrub, a favorite garden plant on the sabana of Bogota. It reaches a height of about 6 feet and is usually broad and bushy in habit. Above the attractive foliage rise numerous spikes of varicolored, pealike flowers. The predominant colors are blue, lilac, white, and yellow.

"To my mind this is a plant well worth cultivating in the United States. In California and Florida it will probably grow as a perennial; elsewhere possibly as an annual."

For previous introduction, see S. P. I. No. 46057.

51567. TACSONIA MANICATA Juss. Passifloraceæ.

"(No. 486a. October 8, 1920.) Seeds of *curuba de Indio.* This is one of the several species cultivated for their fruit on the sabana of Bogota. It is not, as a fruit, as good as the *curuba de Castilla*, but I suspect that the vine is somewhat more ornamental. The oblong green fruits are about 3 inches long, with smaller seeds than the *curuba de Castilla*, and the pulp is not so highly flavored."

For previous introduction, see S. P. I. No. 35113.

51568. TACSONIA PINNATISTIPULA (Cav.) Juss. Passifloraceæ.

"(No. 468a. October 8, 1920.) Seeds of *gulupa*, from Nemocon, Cundinamarca. Both in flower and fruit it greatly resembles the curubas, though from an economic standpoint it is not so valuable as some of the latter. It is a climber, with attractive, deep-green, deeply-lobed leaves, flowers 2 inches broad and of a livelier pink color than those of the common curuba, and round fruits, 2 inches thick, greenish yellow when ripe. The pericarp or outer shell is thicker and more brittle than that of the curubas, resembling in this respect the edible-fruited Passifloras. The white juicy pulp is rather insipid, so that I can not recommend the fruit very highly for eating. It should be worth cultivation as an ornamental."

For previous introduction, see S. P. I. No. 33814.

51569. RUBUS BOGOTENSIS H. B. K. Rosaceæ. Blackberry.

"(No. 483a. October 8, 1920.) Seeds of *mora de piedra*, a blackberry common around the edges of the sabana of Bogota, at altitudes of 8,500 to 9,500 feet. The plant is a very vigorous grower, the canes reaching a length of about 10 feet; they are semierect. The flowers are purplish pink. The fruits, borne in rather large clusters, are about an inch in diameter, nearly round, and are characterized by the large size of the individual drupelets and the relatively small number of the latter which compose the fruit. The color is almost black, the flavor very agreeable, but the seeds are large and hard."

51570. GAULTHERIA PUBIFLORA Blake. Ericaceæ.

"(No. 481a. October 8, 1920.) Seeds of an attractive shrub, growing to about 5 feet in height, found in the mountains near Facatativa at altitudes of 9,000 feet and more. It has small white flowers followed by a profusion of white berries, which render it very ornamental. It will probably want a cool, moist climate for best results."

51556 to 51571—Continued.

51571. MONNINA PARVIFLORA H. B. K. Polygalaceæ.

"(No. 484a. October 8, 1920.) Seeds of a small, half-shrubby plant found near the roadside at Zipacon, Cundinamarca, at an altitude of about 8,000 feet. It bears pretty blue flowers which are followed by oval, deep-blue, glossy berries nearly half an inch long."

51572 to 51588.

From Kenia. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received October 20, 1920. Quoted notes by Doctor Shantz.

51572. CAPPARIS sp. Capparidaceæ.

"(No. 1190. Kisumu, Nyanza Province. July 11, 1920.) A plant called '*sula*' by the natives. The red fruits are eaten by birds."

51573. CASSIA OCCIDENTALIS L. Cæsalpiniaceæ.

"(No. 1188. Kisumu, Nyanza Province. July 11, 1920.) A yellow-flowered leguminous plant resembling Glycyrrhiza in habit."

A glabrous, ill-smelling weed, up to 3 feet high, with short, closely crowded, axillary racemes of yellow flowers; of wide distribution in the Tropics. The seeds, sometimes called "negro coffee," are used in some parts of the world as a substitute for coffee. (Adapted from *Safford, Useful Plants of Guam, p. 218.*)

For previous introduction, see S. P. I. No. 42830.

51574. CROTALARIA sp. Fabaceæ.

"(No. 1185. Kisumu, Nyanza Province. July 11, 1920.) A small hairy podded type."

51575. CUCUMIS sp. Cucurbitaceæ.

"(No. 1178. Kikuyu, Ukamba Province. July 9, 1920.) A small melon or gourd which smells delicious but is very bitter. It is of a light greenish lemon color with indistinct greenish stripes and has warts on the surface."

51576. HIBISCUS sp. Malvaceæ.

"(No. 1195. Kisumu, Nyanza Province. July 11, 1920.) A hibiscus with yellow flowers 2 inches in diameter."

51577 to 51581. HOLCUS SORGHUM L. Poaceæ. **Sorghum**
(*Sorghum vulgare* Pers.)

51577. "(No. 1181. Fort Terman, Nyanza Province. July 10, 1920.) A small type 3 to 5 feet tall."

51578. "(No. 1182. Koru, Nyanza Province. July 10, 1920.) A small type growing along the track."

51579. "(No. 1197. Kisumu, Nyanza Province. July 11, 1920.) Dense, dark wine-colored head and gooseneck."

51580. "(No. 1198. Kisumu, Nyanza Province. July 11, 1920.) An open, red-tan head with very heavy fruits."

51581. "(No. 1199. Kisumu, Nyanza Province. July 11, 1920.) A long white head."

For an illustration of sorghums Nos. 51579 to 51581, see Plate VI.

51582. LEONOTIS sp. Menthaceæ.

"(No. 1192. Kisumu, Nyanza Province. July 11, 1920.) A strikingly beautiful plant with orange-colored flowers; abundant in central Africa."

51583. MEDICAGO HISPIDA DENTICULATA (Willd.) Urban. Fabaceæ.
Bur clover.

"(No. 1179. Elmenteita, Naivasha Province. July 9, 1920.) A small bur clover which grows on very dry soil."

For previous introduction, see S. P. I. No. 48522.



THE DOUM PALM AT HOME. (HYPHAENE THEBAICA (L.) MART.; S. P. I. NO. 51440.)

The doum palm is one of several closely allied forms that make up the genus Hyphaene, which includes the only branching palms known. It thrives in southern Florida and deserves to be widely planted there because of its beauty for landscape-gardening purposes. (Photographed by Dr. H. L. Shantz, Kauro, Kenia Colony, British East Africa, June 26, 1920; P38512FS.)



NATIVE SORGHUMS GROWN BY THE AGRICULTURAL RACES OF KENIA COLONY, BRITISH EAST AFRICA. (HOLCUS SORGHUM L.; S. P. I. NOS. 51579 TO 51581 AND 51953 TO 51957.)

The commercial value to our farmers of the feterita sorghum (No. 19517) introduced from the Sudan in 1906 is said to be $16,200,000, and the Red Amber and Honey sorghums from the same general region are said to be worth $2,000,000 a year. One of the principal objects of the expedition of Dr. H. L. Shantz to East Africa was to procure all the varieties possible of these great grain and forage crops which are cultivated by the agricultural races of that region. He obtained many varieties of sorghums, the heads of a few of which are here shown. The goose-necked type at the left is a dark wine-colored head (No. 51579). Following, in order, are a reddish tan head with very heavy grains (No. 51580), a long white semiopen head (No. 51581), a medium red (No. 51953), a spreading white kafirlike type (No. 51954), a reddish tan (No. 51955), a light tan (No. 51956), and a very dark reddish type (No. 51957). (Photographed by Dr. H. L. Shantz, Kisuma, Nyanza Province, Kenia Colony, July 11, 1920; P38713FS.)

51572 to 51588—Continued.

51584. PENNISETUM SCHIMPERI A. Rich. Poaceæ. **Grass.**

"(No. 1180. Nakuru, Naivasha Province. July 10, 1920.) A coarse foxtail grass, not especially good. It stands up above the more palatable grasses."

A densely cespitose grass, found mostly in dry places; the stems become more than 4 feet tall. The natives consider this a very good forage for stock in general. The leaves yield a fiber which is used for making very stout cord. (Adapted from *Chiovenda, Etiopia, Osservazione Botaniche, p. 66.*)

51585. SENECIO sp. Asteraceæ.

"(No. 1196. Kisumu, Nyanza Province. July 11, 1920.) An orange-flowered rayless composite."

51586. TECOMA STANS (L.) Juss. Bignoniaceæ. **Yellow tecoma.**

"(No. 1183. Kisumu, Nyanza Province. July 11, 1920.) One of the most prominent street trees in East Africa."

A shrub or tree, cultivated in tropical regions for the sake of the terminal panicles of large yellow flowers and the large compound leaves.

For previous introduction, see S. P. I. No. 49873.

51587. OCIMUM SUAVE Willd. Menthaceæ.

"(No. 1193. Kisumu, Nyanza Province. July 11, 1920.) A small, white-flowered mint."

51588. (Undetermined.)

"(No. 1191. Kisumu, Nyanza Province. July 11, 1920.) A small yellow fruit which is very sweet; it may not be edible."

51589 to 51593. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Sydney, New South Wales. Seeds presented by Edw. W. Knox, general manager, Colonial Sugar-Refining Co. Received October 21, 1920. Quoted notes by Mr. Knox.

"Seed collected by our manager of Macknade Mill, Herbert River, Queensland."

51589. "*Badila.* A New Guinea variety of high yield and sweetness. stout growth, and sound constitution."

51590. "*H. Q. 426.* A seedling grown by us in Queensland, of high yield and sweetness, medium thickness, early maturing, medium constitution."

51591. "*1900 seedling.* A Mauritius seedling of high yield and sweetness, medium thickness, early maturing, medium constitution."

51592. "*7 R. 428.* A seedling grown by us in Fiji; high yield, medium quality; suits medium to poor soils."

51593. "*Goru.* A New Guinea variety, of high yield, fair sweetness, and medium constitution."

51594 to 51597.

From British East Africa. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received October 25, 1920. Quoted notes by Doctor Shantz.

51594. HARPACHNE SCHIMPERI Hochst. Poaceæ. **Grass.**
(*Eragrostis schimperi* Benth.)

"(No. 1210. Kisumu, Nyanza Province. July 11, 1920.) A small grass, very abundant; characteristic of the desert country."

A stout annual grass, native to Abyssinia, with dense cespitose stems up to a foot high and narrow leaves up to 6 inches in length. The lax, secund spikes are from 1 to 3 inches long. (Adapted from *Hooker, Icones Plantarum, vol. 4, pl. 1371.*)

51594 to 51597—Continued.

51595. MELOTHRIA sp. Cucurbitaceæ.

"(No. 1215. Port Bell, Buganda Province, Uganda. July 13, 1920.) A small, shiny yellow, cucumberlike plant."

51596. THUNBERGIA sp. Acanthaceæ.

"(No. 1222. Jinja, Eastern Province, Uganda. July 13, 1920.) A trumpet-flower vine with red and orange colored flowers."

51597. TRICHOLAENA ROSEA Nees. Poaceæ. **Natal grass.**

"(No. 1218. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Natal grass."

51598 to 51601. CYAMOPSIS TETRAGONOLOBA (L.) Taub. Fabaceæ. (*C. psoraloides* DC.) **Guar.**

From the Bombay Presidency, India. Seeds presented by Dr. Bhimbhai M. Desai, Deputy Director of Agriculture, Surat, Gujarat. Received October 27, 1920.

"An East Indian annual legume with long straight stems bearing an enormous number of pods which do not open at maturity. The plant is usually 3 or 4 feet high, and each pod contains about seven pale, angular seeds. In India the plant is grown both for green forage and for the seeds, which are used mainly to fatten cattle, but also as human food. The green pods are also used as a vegetable in the same manner as string beans.

"Guar may be grown in any part of the country where cowpeas succeed and is more drought resistant than any other annual legume. It may be utilized as hay, pasturage, or silage." (*C. V. Piper.*)

The following varieties of guar:

51598. *Deshi.*
51599. *Pardeshi.*
51600. *Rozi.*
51601. *Sotia.*

"The *Deshi* guar is used for cattle feed only, while the other three varieties are used for green-vegetable purposes." (*Desai.*)

For previous introduction, see S. P. I. No. 49864.

51602 and 51603. DATURA METEL FASTUOSA (L.) Safford. Solanaceæ.

From the island of Guam. Seeds presented by Glen Briggs, agronomist, Agricultural Experiment Station. Received October 29, 1920. Quoted notes by Mr. Briggs.

An ornamental herbaceous annual, common throughout India and the East Indies, varying in height from 2 to 6 feet. It has entire or deeply toothed leaves about 6 inches long and flowers 7 inches or more in length, varying in color from white to lavender or rose. The plant is propagated by cuttings. (Adapted from *The Garden, vol. 46, p. 225.*)

51602. "Double white-flowered variety, very scarce."

51603. "Double purple-flowered variety."

For previous introduction, see S. P. I. No. 47671.

51604. VITEX CUNEATA Thonn. Verbenaceæ.

From Kaduna, Northern Provinces, Nigeria. Seeds presented by the director, Department of Agriculture. Received November 2, 1920.

"*Ngalibi.* A tree with dark-gray bark and leaves; not unlike though somewhat larger than the horse-chestnut, which it resembles also in the shape of its strong-smelling flowers. Ink is prepared from its bark, and its black fruit is used for food." (*Schultze, The Sultanate of Bornu, p. 97.*)

51605. MANGIFERA INDICA L. Anacardiaceæ. **Mango.**

From Port of Spain, Trinidad, British West Indies. Budwood presented by John F. Waby, acting curator, Department of Agriculture. Received November 2, 1920.

"This was grown at the St. Clair Experiment Station, Trinidad." (*Waby.*)

"*Père Louis.* Size small; form roundish oblong, reniform, swollen at the nak (stigmatic point); nak 2.5 centimeters above the apex; surface greenish

yellow to deep yellow, with a suggestion of red; lenticels small, numerous, brownish; bloom bluish white; skin medium thick; seed large; fiber rather abundant, fine; flesh yellow, tender, and juicy; quality good, moderately vigorous. Monoembryonic. Season, July." (*Wester, Bulletin No. 18, Bureau of Agriculture, Philippine Islands, p. 27.*)

51606. Polakowskia tacaco Pittier. Cucurbitaceæ.

From San Jose, Costa Rica. Fruits presented by Otón Jimenez, Department of Botany, National Museum. Received November 3, 1920.

A cucurbitaceous plant, the fruit of which is used as a green vegetable. It is a near relative to the chayote, but the fruit is smaller, fusiform, beset with stiff spines at the base, and has a quite different flavor. It is one of the primitive foods of the natives of Costa Rica, where it grows wild in moist, shady places of the temperate region, and its use as a vegetable has readily been adopted by the Spanish Costa Ricans. The fruits, about 2½ inches long and 1½ inches broad, hang from short stems and are picked while still green. After removing the basal spines they are boiled in water, or pickled, or made into preserves. They are also a favorite addition to the native soups. (Adapted from *note of Pittier under S. P. I. No. 26244.*)

"The kinds which are cultivated contain very little fiber. They are used in many ways, as greens, pickled, as dessert, as a vegetable, etc., and in any one of these ways are very popular with us, and rightly so, I believe. The most common way consists in cooking the entire fruit with the leaves. When cooked, the skin comes off easily, and by pressing with the thumb and finger the seed comes out easily; all that remains, with the exception of a little fiber, is eaten." (*Jimenez.*)

51607 to 51612.

From Salisbury, Rhodesia, Africa. Seeds presented by H. G. Mundy, agriculturist and botanist, Department of Agriculture. Received November 4, 1920. Quoted notes by Mr. Mundy, except as otherwise stated.

51607. Canavali ensiforme (L.) DC. Fabaceæ. Jack bean.

"*Gotani* bean."

"The jack bean is a native of the West Indies and the adjacent mainland and is a bushy, semierect annual with coarse stems, thickish leaves, purplish flowers, and hard, white pods, 9 to 14 inches long, each containing 10 to 14 white seeds. Usually the roots are well tubercled, and the plant will withstand much drought. It is remarkably free from insects and fungous diseases. It is valuable as forage and as a cover crop or for green manure." (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 49259.

51608. Dolichos lablab L. Fabaceæ. Hyacinth bean.

"Woodforde's dolichos bean; also known as the *Painted Lady* bean."

For previous introduction, see S. P. I. No. 47978.

51609 to 51611. Holcus sorghum L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)

51609. "*Jiba* Kafir corn."

51610. "*M'bele;* native variety of Kafir corn."

51611. "Birdproof Kafir corn."

51612. Stizolobium niveum (Roxb.) Kuntze. Fabaceæ.

"White stringless velvet bean."

"This has now been cultivated in Florida and other Southern States for several years. It requires about the same length of time to mature as the Florida velvet bean (*Stizolobium deeringianum* Bort) or is perhaps slightly earlier. It is, however, much more prolific in seed production and is therefore likely to come into prominent use. It also has the advantage over the Florida velvet bean in being wholly devoid of stinging hairs." (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 46449.

51613 and 51614.

From Los Angeles, Calif. Seeds presented by Dr. P. D. Barnhart. Received November 4, 1920. Quoted notes by Doctor Barnhart.

51613. DICENTRA CHRYSANTHA Walp. Papaveraceæ.

"Our yellow-flowered bleeding heart. It grows at an altitude of 2,500 feet in the Coast Range Mountains."

A glaucous perennial with stiff, coarse, leafy stems 2 to 3 feet high and bipinnate leaves a foot or more in length. The yellow flowers, about half an inch long, are borne in large racemose panicles. In California, where it is native, it is sometimes called "golden eardrops." (Adapted from *Jepson, Flora of Western Middle California, p. 210.*)

51614. MYRCIARIA EDULIS (Vell.) Skeels. Myrtaceæ.
(*Eugenia edulis* Vell.)

"Of fine flavor, but too seedy to be of commercial value. It is a very prolific bearer and evergreen."

The *cambuca*, a native of the State of Rio de Janeiro, Brazil, is commonly cultivated in that country for its fruit. The tree bears the fruits both on the small limbs and on the trunk. These fruits are oblate, about 1½ inches long, with smooth orange skin, and the flesh is divided into two portions. The firm outer flesh is about a quarter of an inch thick, leathery and very acid, while the inner flesh, which constitutes the edible part of the fruit, is soft, translucent and jellylike, and subacid in flavor. It is highly esteemed by the Brazilians.

For previous introduction, see S. P. I. No. 37829.

51615. RUBUS MACROPHYLLUS Weihe and Nees. Rosaceæ.

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received November 5, 1920.

"From St. Martin, Alpes Maritimes, France, at an altitude of about 4,000 feet. The fruit is acid and about seven-eighths of an inch in diameter." (*Trabut.*)

This is a very variable shrub, native to the British Isles. It has arching, very prickly stems, quinate or ternate usually hairy leaves, and panicles of pinkish or white flowers. (Adapted from *Sowerby, English Botany, vol. 3, p. 177.*)

51616. FRAGARIA NILGERRENSIS Schlecht. Rosaceæ. Strawberry.

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. Received November 6, 1920.

This vigorous and hardy strawberry was introduced from China under the direction of Maurice de Vilmorin and is remarkable for its tufted habit, hairy foliage, its small white flowers, and especially for its small, insipid, white hairy fruits. (Adapted from *Journal Société Nationale d'Horticulture, vol. 21, p. 189.*)

51617. RIBES LONGERACEMOSUM Franch. Grossulariaceæ.

From Elstree, Hertfordshire, England. Cuttings presented by Vicary Gibbs, Aldenham House. Received November 10, 1920.

"This species, found in the mountains of western China, bears large black fruits of good flavor, in racemes a foot and a half long." (*Wilson, A Naturalist in Western China, vol. 2, p. 31.*)

For previous introduction, see S. P. I. No. 40458.

Introduced for experiments to determine the resistance of currants to the white-pine blister rust.

51618 to 51622. HOLCUS SORGHUM L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)

From Surat, Gujarat, India. Seeds presented by Bhimbhai M. Desai, Deputy Director of Agriculture. Received November 11, 1920.

Sweet sorghums introduced for the Office of Sugar-Plant Investigations.

51618. *Hundi Jowar.*
51619. *Nilwa Jowar.*
51620. *Red (Ratalio) Jowar.*
51621. *Sundhia Jowar.*
51622. *Utavli Jowar.*

51623. PROTEA ARGENTEA L. Proteaceæ.
(*Leucadendron argenteum* R. Br.)

From South Africa. Seeds received through the Federal Horticultural Board. Received November 11, 1920.

The *witteboom*, or *silver-leaf pine*, is a beautiful tree found native only in the immediate vicinity of Cape Town, Cape Province, where it grows up to 50 feet in height. The numerous white silky leaves, which are lanceolate and up to 7 inches long, are now an article of commerce, being used for curios, mats, bookmarks, etc.; when dry they take ink or paint and are then sold with texts or small scenes depicted on them. (Adapted from *Sim, Forests and Forest Flora of Cape Colony, p. 294.*)

For previous introduction, see S. P. I. No. 41420.

51624. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Ayr, Ayrshire, Scotland. Seeds purchased from McGill & Smith (Ltd.). Received November 15, 1920.

"Scotch timothy seed." (*McGill & Smith.*)

Locally grown seed introduced for timothy-breeding investigations.

51625 and 51626.

From Caracas, Venezuela. Seeds presented by Henry Pittier. Received November 16, 1920.

51625. EUGENIA sp. Myrtaceæ.

Sent without notes from Caracas.

51626. MYRCIARIA sp. Myrtaceæ.

"*Guayabo pesjua.* This is a small tree with a spreading, depressed crown. The flowers are small, white, with a four-celled ovary; the fruits are globose, slightly depressed, 2.5 to 4 centimeters long, with dark-purple smooth skin, a white, sweet-acidulate mesocarp, and one to four seeds. It is a great favorite with the natives and often cultivated. In fact, I have seen it only under cultivation, although I am assured it also grows wild around Valencia." (*Pittier.*)

51627 to 51658.

From East Africa. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received September 9, 1920. Quoted notes by Dr. Shantz.

51627. ACACIA sp. Mimosaceæ.

"(No. 1108. Lasamis, Nyanza Province. Kenia. June 13, 1920.) An acacia."

51628. AMOMUM sp. Zinziberaceæ.

"(No. 1003. Near Meru, Kenia Province, Kenia. June 12, 1920.) A plant with beautiful foliage which branches like that of Alpinia. The deep reddish purple fruit is partly hidden by the chocolate-colored bracts and is borne in clusters. The fruit, which is quite peppery, is eaten by the natives."

51629. AMOMUM sp. Zinziberaceæ.

"(No. 1004. Near Meru, Kenia Province, Kenia. June 12, 1920.) Similar to the preceding, but the fruits are more clustered, the bracts are not visible, and the fruit is not eaten, so far as I know; the fruits are very ornamental."

51630. ANDROPOGON INSCULPTUS Hochst. Poaceæ. **Grass.**

"(No. 1075. Embu, Kenia Province, Kenia. June 17, 1922.) A grass with a forked head, abundant in this section, especially lower down, toward Fort Hall."

For previous introduction, see S. P. I. No. 32447.

51631. AVENA STERILIS L. Poaceæ. **Oats.**

"(No. 1125. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Black oats from the farm at Kabete."

For previous introduction, see S. P. I. No. 49568.

51627 to 51658—Continued.

51632. CASSIA DIDYMOBOTRYA Fres. Cæsalpiniaceæ.

"(No. 1010. En route from Meru to Embu, Kenia Province, Kenia, June 12, 1920.) A beautiful shrub, abundant in this section and cultivated in Belgian Kongo. It blooms and seeds abundantly."

For previous introduction, see S. P. I. No. 43649.

51633. CROTALARIA sp. Fabaceæ.

"(No. 1031. En route from the Uaso Nyiro River to Meru, Kenia Province, Kenia. June 15, 1920.) About 6 feet tall, with large pods and yellow flowers."

51634. CROTALARIA sp. Fabaceæ.

"(No. 1047. Uaso Nyiro River, Kenia Province, Kenia. June 15, 1920.) About 6 feet tall; from the zone below the forest."

51635. DIGITARIA NODOSA Parl. Poaceæ. **Grass.**

"(No. 1042. Uaso Nyiro River, Kenia Province, Kenia. June 15, 1920.) From the short-grass area."

51636. ERAGROSTIS sp. Poaceæ. **Grass.**

"(No. 850. Ngano Ngano, Urundi. March 17, 1920.) Abundant as a semiruderal."

51637. ERYTHRINA sp. Fabaceæ. **Grass.**

"(No. 1064. Chuka, Kenia Province, Kenia. June 16, 1920.) Red bean tree, a prominent wild tree in the forest here; it is wild over much of central Africa and is used as an ornamental in many places."

51638. GUIZOTIA ABYSSINICA (L. f.) Cass. Asteraceæ.

"(No. 1126. Nairobi, Ukamba Province, Kenia. June 24, 1920.) From the farm at Kabete."

An annual, up to 8 feet high, native to Abyssinia. It has narrow opposite leaves, showy yellow flower heads, and black, shiny seeds. It is cultivated in Abyssinia for the oil contained in the seeds. (Adapted from *Chiovenda, Etiopia, Osservazione Botaniche, p. 27.*)

For previous introduction, see S. P. I. No. 44789.

51639. IPOMOEA sp. Convolvulaceæ. **Morning-glory.**

"(No. 999. Uaso Nyiro River, Kenia Province, Kenia. June 12, 1920.) A large leafless (at flowering time) Ipomoea with large purple flowers. It makes a very attractive desert shrub."

51640. MOMORDICA TRIFOLIOLATA Hook. f. Cucurbitaceæ.

"(No. 997. Meru, Kenia Province, Kenia. June 12, 1920.) A cucumberlike fruit with ribbed outer surface; reddish yellow inside, with very red seeds surrounded by edible pulp."

51641. MOMORDICA SCHIMPERIANA Naud. Cucurbitaceæ.

"(No. 1007. Meru, Kenia Province, Kenia. June 12, 1920.) A cucumber with protuberances on the surface. The seeds are covered with red pulp; eaten by the natives."

51642 to 51644. ORYZA SATIVA L. Poaceæ. **Rice.**

51642. "(No. 1110. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Variety *Senna*, from Witu."

51643. "(No. 1114. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Variety *Fine*, from the Charra region."

51644. "(No. 1120. Nairobi, Ukamba Province, Kenia. June 24, 1920.) From the experiment station at Kibos."

51645. PAPPOPHORUM ABYSSINICUM Hochst. Poaceæ. **Grass.**

"(No. 995. Merile, Nyanza Province, Kenia. June 12, 1920.) Not especially abundant, but occasional in the dry desert country."

An annual cespitose grass with erect stems 2 to 4 feet high and linear leaves. (Adapted from *Flora, vol. 38, p. 202.*)

51646. PASPALUM DILATATUM Poir. Poaceæ. **Grass.**

"(No. 1137. Kabete, Ukamba Province, Kenia. June 26, 1920.) One of the most successful introduced plants in this section."

51627 to 51658—Continued.

"This grass has long been introduced in the Southern States, where it is widely distributed. It is a valuable grass for pasturage, particularly on rich land, and not infrequently is cut for hay. It goes very commonly under the name of Dallis grass, but is sometimes called water grass and not infrequently simply paspalum. The grass is a native of Argentina, but is now extensively cultivated in Australia, New Zealand, South Africa, and in general throughout the Tropics." (*Piper.*)

For previous introduction, see S. P. I. No. 35068.

51647. PENNISETUM sp. Poaceæ. Grass.

"(No. 1001. Uaso Nyiro River, Kenia Province, Kenia. June 12, 1920.) A desert grass which grows just on the desert side of the Themeda grassland."

51648. PENNISETUM CILIARE (L.) Link. Poaceæ. Grass.

"(No. 1023. Uaso Nyiro River, Kenia Province, Kenia. June 15, 1920.) A promising grass for desert regions, in which it is quite abundant."

51649. PHASEOLUS VULGARIS L. Fabaceæ. Common bean.

"(No. 1129. Nairobi, Ukamba Province, Kenia. June 24, 1920.) The 'rose-coco' bean, produced in four months at the farm at Kabete."

51650. PHASEOLUS sp. Fabaceæ.

"(No. 1008. Meru, Kenia Province, Kenia. June 12, 1920.) A small-seeded small vine near the Uaso Nyiro River."

51651. RICINUS COMMUNIS L. Euphorbiaceæ. Castor-bean.

"(No. 1119. Nairobi, Ukamba Province, Kenia. June 24, 1920.) Castor-beans from the experimental station at Kibos."

51652. SPOROBOLUS sp. Poaceæ. Grass.

"(No. 1025. Uaso Nyiro River, Kenia Province, Kenia. June 15, 1920.) A fine pasture grass."

51653. VERNONIA sp. Asteraceæ.

"(No. 1057. En route from Meru to Embu, Kenia Province, Kenia. June 16, 1920.) Very ornamental because of its unusually large flowers."

51654. (Undetermined.)

"(No. 1016. Meru, Kenia Province, Kenia. June 16, 1920.) A vine, abundant here, which may be a morning-glory."

51655. (Undetermined.)

"(No. 1017. Lasamis, Nyanza Province, Kenia. June 30, 1920.) A shrub with thick oval leaves and flowers resembling those of the passion flower, with many white stamens. The ripe fruit is reddish or yellowish and filled with seeds. It is eaten in the same manner as chilies and much prized. It has a sharp peppery smell and a sharp pleasant taste and would probably be very useful in making highly seasoned dishes, such as chowchow."

51656. (Undetermined.)

"(No. 1054. En route from Meru to Embu, Kenia Province, Kenia. June 16, 1920. An ampelopsislike vine with a brick-red grapelike single-seeded fruit and rather fleshy leaves. It is common throughout central Africa."

51657. (Undetermined.)

"(No. 1107. Lasamis, Nyanza Province, Kenia. June 13, 1920.) A small evergreen tree found along dry river beds. It looks like a Buxus and is called 'wild coffee.'"

51658. PENTZIA INCANA (Thunb.) Kuntze. Asteraceæ. Karroo bush.

"(No. 1134. Nairobi, Ukamba Province, Kenia. June 25, 1920.) The *karroo* bush does well here, although the climate is cool and comparatively damp. This indicates that the *karroo* bush might do well in both desert and humid regions."

51659. PLACUS BALSAMIFER (L.) Baill. Asteraceæ.
(*Blumea balsamifera* DC.)

From Kuala Lumpur, Federated Malay States. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received November 13, 1920.

"A large plant from which the Chinese make camphor; grows here in waste land." (*Rock.*)

For previous introduction, see S. P. I. No. 51036.

51660 to 51667. CAPSICUM ANNUUM L. Solanaceæ. **Red pepper.**

From Paramaribo, Dutch Guiana. Seeds presented by the director, Department of Agriculture. Received October 15, 1920. Quoted notes by the director.

"Seeds of various varieties of pepper brought to market here."

51660. "*Agi-olina nem.*"
51661. "*Alatta.*"
51662. "*Madame Jeannette gell.*"
51663. "*Montjie gell.*"
51664. "*Montjie rood.*"
51665. "*Papegaai.*"
51666. "*Prasoro* or *Kateo misie.*"
51667. "*Salm.*"

51668. GYNOCARDIA ODORATA R. Br. Flacourtiaceæ.

From Calcutta, Bengal, India. Seeds purchased from Smith, Stanistreet & Co. (Ltd.), through James A. Smith, American consul general. Received November 1, 1920.

A moderate-sized evergreen tree, native to northwestern India from Sikkim eastward to Rangoon, Burma. It bears round, hard fruits on the stem and main branches; these are used for fish poison. The seeds were long supposed to be the source of chaulmoogra oil; the true source was discovered in 1899 to be *Taraktogenos kurzii.*

For previous introduction, see S. P. I. No. 49636.

51669 to 51695.

From Wageningen, Netherlands. Seeds presented by C. J. Hessing, botanist, Instituut voor Veredeling van Landbouwgewassen. Received November 3, 1920. Quoted notes by Mr. Hessing.

51669 to 51676. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

51669. "No. 1. Cultivated timothy, Holland."
51670. "No. 2. Wild timothy growing near Wageningen."
51671. "No. 3. Cultivated timothy, Holland."
51672. "No. 4. High-growing timothy, own culture."
51673. "No. 5. A geniculate variety from Holland."
51674. "No. 6. Wild, growing near Alkmaar."
51675. "No. 7. Wild, growing in light clay near Zutphen."
51676. "No. 8. Wild, from Switzerland."

51677 to 51682. SECALE CEREALE L. Poaceæ. **Rye.**

51677. "No. 8. *Petkusser* × *Krüger.*"
51678. "No. 9. *Krüger.*"
51679. "No. 10. From Zealand Island, Denmark."
51680. "No. 11. *Buhlendorfer.*"
51681. "No. 12. *Klooster.*"
51682. "No. 13. *Petkusser.*"

51683 to 51695. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.**
(*T. vulgare* Vill.)

51683. "No. 1. *Millioen III B.*"
51684. "No. 2. *Imperial.*"
51685. "No. 3. *Concurrent.*"
51686. "No. 4. *Matador.*"
51687. "No. 5. *Essex.*"

51669 to 51695—Continued.

51688. "No. 6. *Geldersche Ris.*"
51689. "No. 7. From Zealand Island, Denmark."
51690. "No. 14. *Imperial II D.*"
51691. "No. 15. *Millioen II.*"
51692. "No. 16. *Batauwe.*"
51693. "No. 17. *Millioen IV.*"
51694. "No. 18. *Squarehead.*"
51695. "No. 19. *Wilhelmina.*"

51696. CYAMOPSIS TETRAGONOLOBA (L.) Taub. Fabaceæ. **Guar.**
(*C. psoraloides* DC.)

From St. Thomas Mount, Madras, India. Seeds presented by G. A. D. Stuart, Director of Agriculture. Received November 16, 1920.

An erect East Indian annual, 3 to 6 feet high, bearing an enormous number of pods which are used as a vegetable like string beans. The plant can be grown for forage, hay, and silage in any part of the country where the cowpea succeeds, and is more drought resistant than any other annual legume.

For previous introduction, see S. P. I. No. 49902.

51697. SOLANUM sp. Solanaceæ. **Wild potato.**

From Bogota, Colombia. Tubers presented by Hermano Apolinar-Maria, Institute de la Salle. Received November 16, 1920.

"Tubers of a wild potato from the Páramos de Quasca, growing at an altitude of 3,100 meters." (*Apolinar-Maria.*)

51698. PISTACIA LENTISCUS L. Anacardiaceæ.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received November 16, 1920.

"A very ornamental bush or small tree which will grow in the very driest positions—for instance, in a fissure of a vertical rock. The wood of this plant is very strong and can be used for making excellent handles for pickaxes and such tools which have to resist heavy wear." (*Proschowsky.*)

A small tree which is found along the coast of the Mediterranean Sea, where it forms a bushy thicket. The evergreen, pinnate, shining leaves exhale a strong aromatic odor when bruised. The tree is particularly ornamental when in flower; the pistillate flowers are purplish green, and the bright purple, very small staminate flowers are clustered in the axils of the leaves. The fruits are the size of lentils and are black when ripe. They are eaten by the natives. The fruits contain an edible, green oil, which is preferred by the Turks to olive oil. In Tunis this oil is largely used for lighting. (Adapted from *Bulletin Société Horticole Tunisie, vol. 14, p. 69.*)

For previous introduction, see S. P. I. No. 9426.

51699. ANACARDIUM OCCIDENTALE L. Anacardiaceæ. **Cashew.**

From Guayaquil, Ecuador. Seeds presented by Dr. Frederic N. Goding, American consul general. Received November 18, 1920.

"Seeds of the *marañon,* which grows wild in the coastal region of this country. The pear-shaped fruit is about 3 inches long; one variety is bright shining yellow, the other bright shining red. The taste is mildly acid and rather pleasant." (*Goding.*)

51700. PARTHENIUM ARGENTATUM A. Gray. Asteraceæ. **Guayule.**

From Marfa, Tex. Plants presented by R. A. Epperson. Received November 18, 1920.

The guayule is a spreading, much-branched shrub, rarely as much as 3 feet in height, with small greenish, silvery gray leaves and a profusion of small yellow flowers borne in loose clusters on slender stems. The shrub is

native to a comparatively small area in southwestern Texas and northern Mexico.

Unlike most other rubber-producing plants, the bark of the guayule contains no latex, the rubber being in the cellular tissue of the epidermis and to a certain extent in the branches and leaves. The dried plants are ground, and the rubber is extracted by one of several chemical processes. Although guayule rubber is not of the highest grade, it has a possible future, because the plant will grow in semiarid regions, it does not suffer from light frosts after passing the seedling stage, and the plants may be gathered throughout the year. (Adapted from *Commerce Reports No. 149, June 26, 1918.*)

For previous introduction, see S. P. I. No. 47955.

51701. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

From Santa Ines, Chile. Seeds presented by A. Fernandez, through Salvador Izquierdo. Received November 22, 1920.

Chilean bean.

For previous introduction, see S. P. I. No. 51198.

51702. PYRUS MALIFOLIA Spach. Malaceæ. **Pear.**

From Paris, France. Cuttings presented by Prof. D. Bois, Museum d'Histoire Naturelle. Received November 23, 1920.

A handsome tree which is a hybrid of doubtful origin, possibly a seedling from *P. auricularis;* the original specimen, 30 feet high, grew in Paris. The leaves are roundish oval, nearly always cordate at the base, and the flowers are 1 to 1½ inches across. The fruit is broadly turbinate, about 2 inches long, and deep yellow when ripe.

For previous introduction, see S. P. I. No. 44048.

51703. ASIMINA TRILOBA (L.) Dunal. Annonaceæ. **Papaw.**

From McConnelsville, Ohio. Budwood presented by H. D. Tennent. Received November 26, 1920.

"The largest late sort of which I know and the mildest in flavor when in best condition." (*Tennent.*)

"Fruit large and of excellent quality." (*David Fairchild.*)

51704. CHAYOTA EDULIS Jacq. Cucurbitaceæ. **Chayote.**
(*Sechium edule* Swartz.)

From Antigua, Guatemala. Fruits presented by W. Cameron Townsend, through Herndon W. Goforth, American vice consul, city of Guatemala. Received November 29, 1920.

"*Guisquil de papa.* The very best variety which has yet come under the range of my observations is the *guisquil de papa* (potato chayote) of Antigua. This is a broadly obovoid fruit about 4 inches in length, plump, perfectly smooth on the surface (though with brownish cracks when fully ripe), and of a dull ivory-white color. This variety is unusually mealy and is of much better flavor than most others. It is, to my mind, the one which should be disseminated most widely in the United States." (*Wilson Popenoe.*)

51705. AMYGDALUS COMMUNIS × PERSICA. Amygdalaceæ.
Peach-almond hybrid.

From Morgan Hill, Calif. Seeds presented by Leonard Coates. Received December 6, 1920.

"A peach-almond hybrid which, Mr. Coates says, bears fruits looking in their early stages like green peaches, but in early September the flesh begins to split open and expose the almondlike pit. He has tried this as a stock and finds that it produces the branching roots of a peach but is more vigorous than any other stock. He guarantees that these seeds will make double the growth of the ordinary peach seeds in the nursery row. This hybrid was procured by Mr. Coates from a man living near Los Gatos." (*David Fairchild.*)

51706. RUBUS MACROCARPUS Benth. Rosaceæ. **Colombian berry.**

From Bogota, Colombia. Plants collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received November 16, 1920.

"(No. 495. Bogota, Colombia. October 14, 1920. Herb. No. 1108.) The giant Colombian blackberry, from El Penon, near Sibate, Cundinamarca, Colombia."

For previous description, see S. P. I. No. 51401.

51707 to 51739.

From Buitenzorg, Java. Seeds presented by the director, Plant-Breeding Station. Received October 26, 1920.

51707. BENTINCKIA NICOBARICA (Kurz) Beccari. Phœnicaceæ. **Palm.**

An elegant little palm with a habit resembling that of a Kentia; its native home is the Nicobar Islands, Indian Ocean. The pinnate, irregularly divided fronds are large and spreading, and the branched spadix bears small purplish berries. (Adapted from *Revue Horticole, vol. 68, p. 249.*)

For previous introduction, see S. P. I. No. 7569.

51708. CALAMUS SCIPIONUM Lour. Phœnicaceæ. **Rattan palm.**
(*Daemonorops fissus* Blume.)

The typical form of this rattan is 40 to 60 feet in height, with alternate, pinnatisect leaves 4 or 5 feet long; the male spadix is 20 feet long and the female 10 feet, and the small ovoid fruits are about one-third of an inch in diameter. This rattan is native to Malaysia, where the canes are employed for making furniture, etc., for which purpose it is especially suitable because of the ease with which it splits. (Adapted from *Heyne, Nuttige Planten van Nederlandsch-Indië, vol. 1, p. 89,* and *Hooker, Flora of British India, vol. 6, p. 461.*)

51709. CARYOTA MITIS Lour. Phœnicaceæ. **Palm.**

A Malayan palm about 20 feet high with a straight cylindrical trunk 4 inches or more in diameter and bipinnate leaves 4 to 9 feet in length. The palm is also found in the island of Reunion, where the natives extract a fiber from it and also utilize the wool found in the axils of the leaves as a textile. (Adapted from *Grisard and Vanden-Berghe, Les Palmiers Utiles, p. 43.*)

For previous introduction, see S. P. I. No. 51128.

51710. CARYOTA RUMPHIANA Mart. Phœnicaceæ. **Palm.**

An East Indian palm about the size of the coconut palm, with a smooth trunk and graceful bipinnate leaves composed of segments with truncate jagged tips. From the central pith of the bark a sago is prepared which is eaten in times of scarcity. (Adapted from *Heyne, Nuttige Planten van Nederlandsch-Indië, vol. 1, p. 106.*)

51711. CHRYSALIDOCARPUS LUCUBENSIS Beccari. Phœnicaceæ. **Palm.**

A rather tall palm from the island of Nossi Be, Madagascar, with elongate pinnate fronds composed of rigid swordlike segments up to 3 feet in length. The obovate fruits are about half an inch long. (Adapted from *Engler, Botanische Jahrbücher, vol. 38, Beiblatt 87, p. 35.*)

51712. DAEMONOROPS TRICHROUS Miquel. Phœnicaceæ. **Palm.**

A rattan from the island of Billiton, East Indies, where it inhabits both the lowlands and the highlands. The stems are about an inch thick, indented at the nodes, with internodes up to 8 inches in length. The upper surface of the stem is gray, and the stems are very hard to split. It is known as "rotan nanga" by the natives; so far as is known it is not used. (Adapted from *Heyne, Nuttige Planten van Nederlandsch-Indië, vol. 1, p. 99.*)

51713. DAMMARA ALBA Rumph. Pinaceæ.
(*Agathis loranthifolia* Salisb.)

A handsome tree growing to 100 feet in height, with a trunk 8 feet in diameter, straight and branchless for two-thirds its length. It is of great commercial importance on account of its yield of the transparent dammar

51707 to 51739—Continued.

resin, extensively used for varnish. It is a native of the East Indian Archipelago and mainland. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 161.*)

For previous introduction, see S. P. I. No. 51129.

51714. DRYMOPHLOEUS AMBIGUUS Beccari. Phœnicaceæ. **Palm.**

A small spineless palm, less than 8 feet high, native to New Guinea, with pinnate fronds about 4½ feet long and fleshy ovoid fruits nearly an inch in length. (Adapted from *Beccari, Malesia, vol. 1, p. 42.*)

51715. DRYMOPHLOEUS PROPINQUUS Beccari. Phœnicaceæ. **Palm.**

A rather small palm, native to New Guinea, with a stem up to 2½ meters high and 2 centimeters thick. The leaves, about 1½ meters long, are irregularly pinnate, with pinnæ about 30 centimeters long. (Adapted from *Beccari, Malesia, vol. 1, p. 43.*)

For previous introduction, see S. P. I. No. 49532.

51716. DRYMOPHLOEUS sp. Phœnicaceæ. **Palm.**

Received as *Actinophloeus macarthurii*, for which a place of publication has not yet been found. The species of Actinophloeus are now generally referred to Drymophloeus.

51717. DRYMOPHLOEUS sp. Phœnicaceæ. **Palm.**

Received as *Actinophloeus sanderiana*, for which a place of publication has not yet been found. The species of Actinophloeus are now generally referred to Drymophloeus.

51718. ELAEIS GUINEENSIS Jacq. Phœnicaceæ. **Oil palm.**

The oil palm is native to the western coast of Africa, but has become distributed throughout the Tropics. The palm becomes 16 to 20 meters in height and bears fruits of the size and form of a plum, yellow or brownish at maturity, according to the variety.

These fruits, a thousand or more of which are borne upon one raceme, have a hard, woody endocarp surrounded by a fibrous, fleshy pulp, which contains a large percentage of oil. The seed contains an oleaginous kernel which is exported to Europe under the name *palmiste*, or palm-nut oil. The orange-colored oil from the pulp is known simply as palm oil, and this is seen in Europe only in the solid state and is used in making soap. The other oil, which is white, is used in making very fine soaps. (Adapted from *Capus and Bois, Les Produits Coloniaux, p. 294.*)

For previous introduction, see S. P. I. No. 48633.

51719. EUTERPE ACUMINATA (Willd.) Wendl. Phœnicaceæ. **Palm.**
(*Oenocarpus utilis* Klotzch.)

A graceful spineless palm from tropical South America, with a trunk 36 feet tall, terminated by about 10 pinnate fronds 7 or 8 feet long. The black, roundish fruits are fleshy and about half an inch in diameter. (Adapted from *Linnaea, vol. 20, p. 447.*)

51720. LATANIA COMMERSONII Gmel. Phœnicaceæ. **Palm.**

A palm from the island of Mauritius which reaches a height of 30 to 40 feet, with lightly spiny, fan-shaped leaves marked with red in young trees. The leaves are used by the natives in making fans, hats, mats, etc. (Adapted from *Grisard and Vanden-Berghe, Les Palmiers Utiles, p. 103.*)

For previous introduction, see S. P. I. No. 45960.

51721. LATANIA LODDIGESII Mart. Phœnicaceæ. **Palm.**

A very robust palm, native to Mauritius, up to 50 feet in height. The hairy leafstalks are 3 to 4 feet long, and the blades of the whitish fan-shaped leaves are 3 to 5 feet in length. This species is cultivated throughout the Tropics and when young makes a very decorative pot plant. (Adapted from *Rock, Ornamental Plants of Hawaii, p. 33.*)

51722. LATANIA VERSCHAFFELTII Lem. Phœnicaceæ. **Palm.**

A palm 40 feet in height with densely tomentose petioles 5 to 8 feet long, spiny on the young plants. The pale-green leaves are about 5 feet in diameter, with divisions 2½ feet long and 2 inches wide. This palm grows abundantly on the island of Rodriguez, east of Mauritius. (Adapted from *Gardeners' Chronicle, third series, vol. 31, p. 140.*)

51707 to 51739—Continued.

51723. LICUALA RUMPHII Blume. Phœnicaceæ. **Palm.**

A rather showy dwarf fan palm grown for its peculiar habit and handsome foliage. The slender stem bears a crown of long-petioled roundish leaves, 3 feet or more in diameter, with 12 to 15 segments. The simply branched spadix, 4 or 5 feet long, bears the small ellipsoid fruits. Native to Celebes and Borneo. (Adapted from *Blume, Rumphia, vol. 2, p. 41.*)

51724. MARTINEZIA EROSA Linden. Phœnicaceæ. **Palm.**

A rather small South American palm, covered throughout with long needlelike spines. The pinnate leaves consist of a few pairs of narrowish leaflets at the base with a pair of broader ones at the apex, which is truncate and ragged. (Adapted from *Gardeners' Chronicle, 1872, p. 1296.*)

51725. NENGA SCHEFFERIANA Beccari. Phœnicaceæ. **Palm.**

A graceful spineless rather small Malayan palm with long-stemmed pinnate leaves and ellipsoid fruits about an inch in length. (Adapted from *Annales, Jardin Botanique de Buitenzorg, vol. 2, p. 84.*)

51726. ONCOSPERMA FILAMENTOSUM Blume. Phœnicaceæ. **Palm.**

An elegant palm with a trunk 30 to 40 feet high, distinctly annulate and armed, and with a thick, graceful crown. The pinnate leaves are 10 to 12 feet long, with pinnæ about a foot in length. This palm is common on the borders of the paddy swamps in the Malay Peninsula. (Adapted from *Calcutta Journal of Natural History, vol. 5, p. 464.*)

For previous introduction, see S. P. I. No. 49548.

51727. PANDANUS ATROCARPUS Griffith. Pandanaceæ. **Screw pine.**

A tree 40 to 60 feet high and about 6 inches in diameter, with linear acuminate dark-green leaves 20 feet long and 4 inches wide. The fragrant white spikes are 4 to 6 inches long and the fruits an inch long. The leaves are used for making coverings for carts, for screens, hats, etc. (Adapted from *Ridley, Materials for a Flora of the Malayan Peninsula, pt. 2, p. 230.*)

51728. PANDANUS FURCATUS Roxb. Pandanaceæ. **Screw pine.**

One of the most ornamental of the screw pines, attaining a height of about 5 meters, with dark-green, linear, spiny leaves, 3 or 4 or more meters long, gracefully arching and somewhat spirally arranged. The whitish gray inflorescence emits a very agreeable odor. Native to the East Indies. (Adapted from *Revue Horticole, vol. 51, p. 290.*)

For previous introduction, see S. P. I. No. 39652.

51729. PANDANUS LABYRINTHICUS Kurz. Pandanaceæ. **Screw pine.**

A shrub 15 to 20 feet high, with erect-spreading branches, and a slender, warty trunk which sends out stiltlike, intricate aerial roots. The somewhat leathery linear leaves, 4 to 6 feet long, are shining above, with the margins and midribs densely spiny with curving white spines. The drupes are shining olive green, becoming golden. Native to the East Indies. (Adapted from *Miquel, Annales Musei Botanici Lugduno-Batavi, vol. 2, p. 53.*)

51730. PANDANUS POLYCEPHALUS Lam. Pandanaceæ. **Screw pine.**

An East Indian screw pine with leaves about 3 feet long and 2 inches wide. The natives eat the young snow-white leaves, which are tender and sweet, and also the unopened flower heads. (Adapted from *Heyne, Nuttige Planten van Nederlandsch-Indië, vol. 1, p. 29.*)

51731. PANDANUS TECTORIUS Parkins. Pandanaceæ. **Screw pine.**

A small tree with a trunk which usually begins to branch very low, the branches bending nearly to the ground; the leaves are long, sword-shaped, armed with spines on the margins and keel, and of great textile strength. The tree is native to Oceanica and was introduced into Guam probably at a very early date. In the latter place the natives plant this species in hedges, where it serves the double purpose of a fence and a source of material for cordage, mats, hats, and bags. (Adapted from *Safford, Useful Plants of Guam, p. 344.*)

For previous introduction, see S. P. I. No. 51138.

51707 to 51739—Continued.

51732. PANDANUS VANDERMEESCHII Balf. f. Pandanaceæ. **Screw pine.**

This screw pine is from the island of Mauritius and becomes 15 feet or more in height, with two side branches extending to about 8 feet from the main trunk. The stiff suberect leaves are 2 or 3 feet long, with strong, red spines. The triangular-round fruits are borne on the side branches and are about 9 inches long. (Adapted from *Gardeners' Chronicle, third series, vol. 18, p. 237.*)

For previous introduction, see S. P. I. No. 9726.

51733 and 51734. PHOENIX RECLINATA Jacq. Phœnicaceæ. **Palm.**

A bushy or arborescent palm found native in the coastal districts of South Africa, where it sometimes becomes as much as 40 feet in height. The reclinate pinnate leaves are 6 to 9 feet long, with 30 to 50 pairs of leaflets. The elongate berries, about half an inch long, are yellowish when ripe, with a sweetish pulp. (Adapted from *Marloth, Flora of South Africa, vol. 4, p. 49.*)

51733. A form with large seeds, over an inch long.

51734. A form with seeds only half an inch long.

For previous introduction, see S. P. I. No. 23424.

51735. PINANGA KUHLII Blume. Phœnicaceæ. **Palm.**

A stout, rapid-growing palm, native to the lower altitudes of western Java, becoming 16 to 25 feet high, with annulate stems 2 inches in diameter, reddish when young, and beautiful terminal fronds with pinnate blades 4 feet long and half as wide. This is one of the hardiest species of Pinanga known. (Adapted from *Gardeners' Chronicle, third series, vol. 31, p. 97.*)

For previous introduction, see S. P. I. No. 49554.

51736. PTYCHANDRA GLAUCA Scheff. Phœnicaceæ. **Palm.**

A rather small East Indian palm with a slender trunk and very graceful pinnate fronds up to 12 feet in length; the longest pinnæ are 2½ feet. The spadix, borne at right angles to the trunk, is 3 feet long, with a reddish covering at the base, and the fruits are round and reddish. (Adapted from *Annales du Jardin Botanique de Buitenzorg, vol. 1, p. 160.*)

51737. RHOPALOBLASTE HEXANDRA Scheff. Phœnicaceæ. **Palm.**

A slender East Indian palm of medium height, with somewhat drooping pinnate fronds 3 or 4 feet long, composed of a large number of lanceolate pinnæ diminishing in size toward the summit and base of the frond. (Adapted from *Annales du Jardin Botanique de Buitenzorg, vol. 1, p. 156.*)

51738. SEAFORTHIA ELEGANS R. Br. Phœnicaceæ. **Palm.**

An elegant palm, native to the southern coast of Australia and the neighboring islands. It becomes 30 feet in height, with dark-green pinnate fronds up to 15 feet in length, and bears small oval berries which are fibrous in texture. (Adapted from *Flore des Serres, vol. 20, p. 93.*)

For previous introduction, see S. P. I. No. 38540.

51739. TILMIA CARYOTAEFOLIA (H. B. K.) O. F. Cook. Phœnicaceæ.
(*Martinezia caryotaefolia* H. B. K.) **Palm.**

A small but graceful palm, native to tropical South America, becoming 30 feet in height. The erect stem is slightly swollen at the base and is clearly ringed; these rings are armed with stiff black slender spines 2 or 3 inches long. The bright-green terminal pinnate fronds are 4 to 5 feet long, spreading, and drooping. (Adapted from *Curtis's Botanical Magazine, pl. 6854.*)

For previous introduction, see S. P. I. No. 25944.

51740. ARONIA ARBUTIFOLIA (L.) Pers. Malaceæ.

(*Pyrus arbutifolia* L. f.)

From Atlanta, Ga. Seeds purchased from Otto Katzenstein & Co. Received December 18, 1920.

Native North American shrub, very showy in late fall and winter, with its brilliant red fruits and scarlet leaves. Grows wild from New York to Ohio, Arkansas, and Florida.

For previous introduction, see S. P. I. No. 44379.

51741. Ziziphus spina-christi (L.) Willd. Rhamnaceæ.

From Haifa, Syria. Seeds presented by Amram Khazanoff, Jewish Colonization Association. Received November 11, 1920.

"Fruit of *Ziziphus spina-christi*, locally known as *sidr*, which you may find worth while experimenting with as a stock for the jujube." (*Khazanoff.*)

For previous introduction, see S. P. I. No. 44361.

51742. Acrocomia sclerocarpa Mart. Phœnicaceæ. **Macauba palm.**

From Lavras, Minas Geraes, Brazil. Seeds presented by Escola Agrícola. Received November 15, 1920.

The *gru gru*, an exceedingly handsome palm, native to Trinidad and very common there. It is tall growing, with a single stem about 1 foot in diameter, ventricose, with long black spines all over the stem, and a handsome head of very fine foliage; the leaves, 9 to 12 feet long, are gracefully drooping. The abundant round fruits are yellowish brown and 2 inches in diameter. The pulp of the fruits and kernels of the seeds are edible, and a valuable oil is obtained from the latter. Handsome walking sticks are made from the stems. (Adapted from the *Journal of the Board of Agriculture of British Guiana, vol. 12, p. 271.*)

For previous introduction, see S. P. I. No. 37382.

51743. Prunus bokhariensis Royle. Amygdalaceæ. **Plum.**

From Shahjahanpur, United Provinces, India. Seeds presented by N. L. Rockey, district superintendent. Received November 20, 1920.

"Plum seed which I hope may be of some use, although I suppose that California plums may have been derived from them. I do not know whether these would make prunes or not. They are certainly sweet enough." (*Rockey.*)

For previous introduction, see S. P. I. No. 43988.

51744 to 51747. Aconitum spp. Ranunculaceæ. **Monkshood.**

From Edinburgh, Scotland. Seeds presented by Dr. Isaac Bayley Balfour, director, Royal Botanic Garden. Received November 23, 1920.

51744. Aconitum ferox Wall.

A plant with an erect stem 3 to 6 feet high, rounded, palmately trifid leaves cut into irregularly indented lobes. The large pale-blue flowers are in a terminal dense-flowered raceme. The mass of the root sold by Indian druggists as aconite is derived from this species. The active principle in the root is an alkaloid, pseudoaconitine. It is used as a narcotic sedative, as an external application for neuralgia, etc., and internally chiefly in the treatment of chronic intermittent fevers. (Adapted from *Watt, Dictionary of the Economic Plants of India, vol. 1, p. 87,* and *National Standard Dispensatory, p. 98.*)

For previous introduction, see S. P. I. No. 38993.

51745. Aconitum fischeri Reichenb.

As a garden plant this is at once one of the best, and well worth growing in any collection of hardy plants. The growth reaches 4 to 6 feet, terminated by a fine panicle of large, showy pale-blue flowers. It is an autumn-flowering species from Siberia and Kamchatka.

Medicinally, this plant is known as Japanese aconite and is imported quite largely into Europe, frequently finding its way to the United States. The Japanese aconite contains as its active constituent an alkaloid called japaconitine, which is now generally believed to be identical with aconitine (the alkaloid in *A. napellus*). (Adapted from *Flora and Sylva, vol. 1,* and *National Standard Dispensatory, pp. 98 and 101.*)

51746. Aconitum septentrionale Koelle.

A plant native to the Himalayas from Chitral to Kumaon, mostly in forests, locally abundant at altitudes of 5,000 to 12,000 feet in Kashmir. The root is perennial, elongate; the stem erect, 3 to 6 feet high, much branched. The flowers are pale yellow or dull purple, with a short-beaked

51744 to 51747—Continued.

helmet which has a long cylindrical dorsal prominence. This species also yields much of the aconite of European commerce. (Adapted from *Kirtikar, Indian Medicinal Plants, vol. 1, p. 10.*)

51747. ACONITUM VARIEGATUM L.

A large plant reaching 1.5 meters in height, found in certain humid forests of the Swiss Alps, and bearing from July to September beautiful blue flowers often streaked with white. The upper sepal is the shape of a helmet and at least twice as tall as wide. At the base of each flower stalk the plant usually bears two or three adventitious roots swollen into tubercles. The tubers are smaller than those of *A. napellus* (the officinal variety of aconite), but closely resemble small specimens of it. (Adapted from *Bonnier, Flore Complète Illustrée en Coulcurs de France, Suisse, et Belgique, vol. 1, p. 39.*)

51748 to 51750.

From Ness, Neston, England. Seeds presented by A. K. Bulley. Received November 24, 1920.

51748. ANDROSACE COCCINEA Franch. Primulaceæ.

"The scarlet androsace. Not hardy, will need a greenhouse in winter; dies after flowering, but makes good seed if it is allowed to flower in the open." (*Bulley.*)

51749. GENTIANA sp. Gentianaceæ. **Gentian.**

Received as *Gentiana farreri*, for which a place of publication has not yet been found.

51750. MECONOPSIS PSEUDOINTEGRIFOLIA Prain. Papaveraceæ.

A biennial with huge flowers of a delightful citron color touched with green. It differs from *M. integrifolia* in having the flowers on a common stalk.

51751. FICUS CARICA L. Moraceæ. **Fig.**

From Austin, Tex. Plants presented by F. T. Ramsey. Received November 26, 1920.

"The *Ramsey* fig. This has proved to be the best we have ever seen. One cutting bore 81 figs seven months after planting. Every cutting planted in March will bear figs by fall." (*Ramsey.*)

51752. MALUS GLAUCESCENS Rehder. Malaceæ. **Wild crab apple.**

(*Pyrus glaucescens* Bailey.)

From Rochester, N. Y. Trees presented by John Dunbar, Department of Parks. Received November 30, 1920.

"Seedlings of *M. glaucescens*, perhaps 4 years old, which have large deep roots. They will, I think, suit your purpose for stock plants. When in bloom it is a beautiful ornamental plant." (*Dunbar.*)

For previous introduction, see S. P. I. 49036.

51753 to 51758.

From Richmond, Victoria, Australia. Seeds presented by F. H. Baker, through Harlan P. Kelsey, Salem, Mass. Received December 7, 1920.

51753 and 51754. CALLITRIS CUPRESSIFORMIS Vent. Pinaceæ.

51753. Received as a "variety of Murray pine" without further description.

An elegant, moderate-sized cypresslike tree, native to Australia, introduced and acclimatized at Hakgala Gardens, Ceylon, where it bears seeds freely. Very ornamental for lawns, etc., and good for timber, fuel, etc. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting, pp. 400 and 454.*)

For previous introduction, see S. P. I. No. 51282.

51754. Received simply as "Murray pine," apparently the typical form.

51753 to 51758—Continued.

51755. CANDOLLEA GRAMINIFOLIA (Swartz) F. Muell. Candolleaceæ.
(*Stylidium graminifolium* Swartz.)

"Trigger plant." (*Baker.*)

An interesting tufted plant with scapes of large, beautiful rose-lilac flowers and beautiful narrow swordlike leaves, very glabrous, 5 to 8 inches long, the outermost gracefully recurved. (Adapted from *Le Jardin Fleuriste, vol. 3, p. 286.*)

For previous introduction, see S. P. I. No. 44324.

51756. EUCALYPTUS ALPINA Lindl. Myrtaceæ.

A scrambling small tree with stringy bark, coriaceous leaves almost greasy in luster, fugose buds, and fruits which though smaller than those of *E. muelleri* have some resemblance to them. The tree is confined to the highest parts of the Grampians (Victoria). (Adapted from *Maiden, Critical Revision of the Genus Eucalyptus, vol. 1, p. 259,* and *vol. 3, p. 163.*)

For previous introduction, see S. P. I. No. 49860.

51757 and 51758. KENNEDIA MONOPHYLLA Vent. Fabaceæ.
(*Hardenbergia monophylla* Benth.)

51757. "The purple native sarsaparilla from Panton Hill District." (*Baker.*)

An ornamental Australian vine, with solitary obtuse leaflets up to 4 inches in length and numerous violet or rose-purple flowers borne in twos or threes in racemes. (Adapted from *Maiden, Flowering Plants and Ferns of New South Wales, pt. 1, p. 55.*)

For previous introduction, see S. P. I. No. 45790.

51758. "Variety *fruticosa.*"

51759 to 51761. MANGIFERA INDICA L. Anacardiaceæ. Mango.

From Buitenzorg, Java. Seeds presented by Dr. M. W. Docters van Leeuwen, director, Botanic Garden. Received December 11, 1920. Quoted notes by the director.

51759. "Variety *aroemanis.*"

51760. "Variety *golek.*"

51761. "Variety *madoe.*"

51762. ADONIS VERNALIS L. Ranunculaceæ.

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. Received December 14, 1920.

A fine perennial reaching a height of 2 feet and bearing glistening yellow blossoms, in full sun often measuring 3 to 4 inches across. The entire plant contains about 10 per cent of aconitic acid, which is used in medicine as a substitute for digitalis to slow the action of the heart, increase the force of the heart beat, and increase the blood pressure. (Adapted from *Gardening Illustrated, vol. 29, p. 146,* and *National Standard Dispensatory, p. 104.*)

51763 and 51764.

From Bogota, Colombia. Seeds collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received December 3, 1920.

51763. HYLOCEREUS sp. Cactaceæ. Cactus.

"(No. 510a. Bogota, Colombia. October 24, 1920.) *Pitahaya blanca* (white pitahaya), from the Bogota market. A rare edible-fruited cactus cultivated in Cundinamarca, probably at altitudes of 4,000 to 5,000 feet. The fruits are elliptic and rather slender in outline, about 4 inches long, light yellow externally, containing within a quantity of white, translucent flesh in which small black seeds are embedded. The flavor and quality of the fruit are rather better than those of other pitahayas I have seen." (*Popenoe.*)

51763 and 51764—Continued.

51764. RUBUS MACROCARPUS Benth. Rosaceæ. **Colombian berry.**

"(No. 509a. Bogota, Colombia. October 24, 1920.) The *Colombian berry* or *giant blackberry of Colombia* (Spanish, *mora* or *mora de Castilla*). From El Penon, on the road between Sibate and Fusagasuga, Cundinamarca. Seeds from unusually large and fine fruits of the giant blackberry, of which seeds and plants have been sent in under previous numbers."

For description, see S. P. I. Nos. 51401 and 51706.

51765 to 51768.

From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received December 3, 1920. Quoted notes by Mr. Rock.

51765. BOTOR TETRAGONOLOBA (L.) Kuntze. Fabaceæ. **Goa bean.**
(*Psophocarpus tetragonolobus* DC.)

"No. 28. A bean with four-winged pods, which are borne in great abundance. They are collected while quite green and cooked like string beans. I have eaten this vegetable and found it very delicious, better than the green string bean. Cultivated in Malaya."

For previous introduction, see S. P. I. No. 49711.

51766. CANARIUM sp. Balsameaceæ.

"No. 23. Native to China and sold in the markets at Singapore. The seed is edible, like the pili nut of the Philippines."

51767. CARAPA GUIANENSIS Aubl. Meliaceæ. **Crabwood tree.**

"No. 4. A tall tree with large leaves and large globose fruits containing many angular and variably shaped fawn-colored seeds. It is known as the crab-oil tree and is a native of Guiana and tropical Africa. It is cultivated in Singapore."

This tree, which has large ovate leaves, bears triangular nutlike fruits, ripening in June, July, and August; when crushed these exude a rich oil. This oil appears to be equal in lubricating value to ordinary machine oil, and it should be utilized. The cakes from which the oil has been expressed might serve as cattle feed. The tree grows in commercial quantities throughout the lower Amazon regions. The wood excels mahogany. (Adapted from *Lange, Lower Amazon, pp. 11, 406, and 461.*)

For previous introduction, see S. P. I. No. 44711.

51768. COLEUS ROTUNDIFOLIUS (Poir.) Cheval. and Perr. Menthaceæ.
(*C. tuberosus* A. Rich.)

"No. 13. This labiate is now cultivated in the Malay Peninsula as a substitute for potatoes. The tubers are produced in abundance, but are small and thin skinned. Plants grown from tubers will produce no tubers the first year, but when planted from cuttings of the green portion of the stem they will produce tubers in five months. The tubers are fully mature when the leaves begin to drop."

For previous introduction, see S. P. I. No. 20427.

51769. LANSIUM DOMESTICUM Jack. Meliaceæ. **Langsat.**

From Buitenzorg, Java. Seeds presented by Dr. J. C. Koningsberger, director, Botanic Garden. Numbered May, 1921.

An erect symmetrical tree, native to the Malay Archipelago, 35 to 40 feet high, with pinnate leaves composed of five to seven leaflets 4 to 8 inches long. The velvety, straw-colored fruits, 1 to 2 inches in diameter, in clusters of 5 to 30, have delicious white aromatic subacid flesh and are usually eaten out of hand, but are also of culinary value.

For previous introduction, see S. P. I. No. 47230.

51770. DIALIUM LAURINUM Baker. Cæsalpiniaceæ.

From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received December 3, 1920.

"No. 27. A leguminous tree, with edible fruits, native to Malaya." (*Rock.*)

An erect, unarmed tree, native to Malakka, with oblong, rigidly coriaceous leaflets, 4 to 5 inches long, glossy above. The copious, obscure flowers are in ample terminal and axillary panicles. The black 1-seeded pod is fragile, roundish, 1 inch deep, and thinly coated with grayish brown down. The seed is as large as a bean. (Adapted from *Hooker, Flora of British India, vol. 2, p. 269.*)

51771. MANGIFERA INDICA L. Anacardiaceæ. **Mango.**

From Buitenzorg, Java. Seeds presented by Dr. J. C. Koningsberger, director, Botanic Garden. Received October 15, 1920.

"A mango grown near Surabaya, Java, which has fruits more than 12 inches long, of good quality." (*David Fairchild.*)

51772 to 51777.

From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received December 3, 1920. Quoted notes by Mr. Rock.

51772. FLACOURTIA RUKAM Zoll. and Mor. Flacourtiaceæ.

"No. 30. A handsome tree with small edible berries which make a fine preserve. Native to Malaya."

An unarmed tree with pubescent young branches, glabrous coriaceous leaves 3 to 5 inches long and 1¼ to 2 inches wide, and 4-flowered umbels. The tree is much cultivated for its fruits, the size of a large cherry. (Adapted from *Hooker, Flora of British India, vol. 1, p. 192.*)

51773. HYDNOCARPUS ANTHELMINTHICA Pierre. Flacourtiaceæ.

"No. 31. The Siamese chaulmoogra tree."

A vigorous tree, 10 to 20 meters high, with graceful furrowed branches; entire, coriaceous leaves, 10 to 30 centimeters long, pale yellowish above, shining below; and two to three, few-flowered, unilateral racemes of rose-colored or purple flowers. The fruit is large, round, 8 centimeters in diameter, and contains about 80 grayish, nearly ovate seeds. The seeds and the oil expressed from them have been used by the Chinese for three centuries for skin diseases. The tree is called false chaulmoogra by European pharmacists. (Adapted from *Bulletin, Société Botanique de France, vol. 55, p. 523.*)

For previous introduction, see S. P. I. No. 48228.

51774. MANGIFERA ODORATA Griffith. Anacardiaceæ.

"No. 32. A large tree with edible green fruits larger than the ordinary mangos, with a very strong odor. Sold on the market in Singapore."

"This interesting relative of the cultivated mango is indigenous to the island of Malakka, the home of most of the species of Mangifera. At Singapore it is called *kuwini.* The name *bumbum* appears to be applied to it in Java. It is a tall tree, said to attain a height of 80 to 100 feet, the trunk and crown resembling those of *M. indica.* It is glabrous throughout or very obscurely pubescent on the panicle; the leaves are 6 to 12 inches long and 2 to 4 inches broad. The odorous flesh-colored flowers are one-fourth of an inch broad; the petals three times as long as the reflexed greenish sepals, which are suffused with blood red. The fruit is oblong, yellow-green, spotted with yellow, offensive in odor, but with yellow fibrous pulp of sweet flavor and lacking any taste of turpentine, which is so frequent in inferior forms of *M. indica.* The stone is compressed and fibrous. While perhaps of not great value for its fruit, this species possesses considerable interest as a possible stock for the mango and for breeding experiments. In the region where it is found the fruit is said to be eaten by the natives, but not by Europeans." (*Popenoe.*)

51772 to 51777—Continued.

51775. MERRILLIA CALOXYLON (Ridley) Swingle. Rutaceæ. **Katinga.** (*Murraya caloxylon* Ridley.)

"No. 26. A tree with large citronlike, somewhat woody fruit. The seeds are embedded in a thick resinous substance which may be of economic importance. The seeds germinate readily."

The *katinga*, a tree of considerable size, native to southern Siam and Upper Perak, is famous in the Malay Peninsula for its beautiful wood, which is light yellow, ornamented with dark-brown streaks and stains, fairly hard in texture, and takes a good polish. The large yellowish green flowers are borne in small panicles; the thin, bright deep-green leaves, 8 inches long, have 13 leaflets and a flattened winged rachis. The fresh fruits are subglobose, 70 to 80 millimeters in diameter, nearly smooth, gray-green, with a leathery pericarp 10 to 12 millimeters thick with irregular branched lacunæ filled with resinous gum. The five to six locules, divided by cartilaginous solid walls 3 to 4 millimeters thick, are filled with a transparent jellylike gum surrounding the seeds. It is possible that this species would be worthy of cultivation as an ornamental plant. (Adapted from *Philippine Journal of Science, vol. 13, p. 338.*)

51776. ONCOSPERMA HORRIDUM (Griffith) Scheff. Phœnicaceæ. **Palm.**

"No. 20. The *nibung*, a very ornamental palm 80 feet high, which grows usually in swampy forests. The trunk is covered with spines; the wood is used for the manufacture of walking sticks."

A tree with an armed trunk and few, spreading leaves, 14 to 16 feet long, bearing very narrow, acuminate, spreading, coriaceous leaflets 2 to 3 feet long. There are two complete acutely margined spathes—the inner cuspidate, the outer 1 to 1½ feet long and armed. The purplish black fruit is borne on pendulous spadix branches 2 to 3 feet long. (Adapted from *Hooker, Flora of British India, vol. 6, p. 415.*)

For previous introduction, see S. P. I. No. 49549.

51777. ONCOSPERMA TIGILLARIA (Jack) Ridley. Phœnicaceæ. **Palm.**

"No. 21. A palm similar to *Oncosperma horridum* [S. P. I. No. 51776 (Rock's No. 20)], but much more graceful. It also occurs in swampy forests."

A very elegant palm, 30 to 40 feet high, distinctly annulate, armed, with a thick graceful crown. The pinnate leaves are 10 to 12 feet long, the pinnæ 2 feet long, pendulous, coriaceous, ferruginous scurfy, bearing on the under side scales attached by their middle. The globose berries, the size of a carbine bullet, are borne on pendulous, purplish sanguineous spadix branches. The two spathes are boat-shaped and stout, the outer is green, covered here and there with whitish ferruginous scurf and armed on the outer surface. The inner spathe is almost unarmed, more scurfy, and velvety to the touch. The trunk is much used for making posts. Native to borders of paddy swamps in Malakka and in forests in Lainear. (Adapted from *Calcutta Journal of Natural History, vol. 5, p. 465.*)

51778. ZEA MAYS L. Poaceæ. **Corn.**

From Marseille, France. Seeds presented by Mr. Stieljès, Institut Colonial de Marseille, through Dr. P. J. S. Cramer. Received October 5, 1920.

"A curious variety of corn with a small cob and small cream-colored grains, which is said to be very productive." (*Cramer.*)

51779 and 51780. CORYLUS COLURNA L. Betulaceæ. **Turkish hazel.**

From Rochester, N. Y. Seeds presented by John Dunbar, assistant superintendent, Department of Parks,, through R. E. Horsey, Highland Park Greenhouses. Received October 25, 1920.

51779. The Constantinople nut is a vigorous, free-growing tree, up to 60 feet in height, with a stout trunk, more or less horizontal branches,

51779 and 51780—Continued.

heart-shaped, glossy green leaves 5 inches long, and small hard-shelled nuts inclosed in fleshy, hairy, green involucres. (Adapted from *Gardeners' Chronicle, third series, vol. 40, p. 256.*)

For previous introduction, see S. P. I. No. 49194.

51780. Variety *pyramidalis*. A form of more compact, conelike habit.

51781 to 51785.

From Coban, Guatemala. Seeds presented by Gustav Helmrich. Received November 2, 1920.

51781. PANICUM GLUTINOSUM Swartz. Poaceæ. Grass.

"A grass growing in woods from Cuba and Mexico to southern Brazil, originally described from Jamaica. In Brazil called 'graminha do matte' and considered the best of shade grasses. In the West Indies known as 'ginger grass' and 'burr.'" (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 49450.

51782. PANICUM LAXUM Swartz. Poaceæ. Grass.

A more or less spreading grass with simple or sparingly branched culms 40 to 100 centimeters high. Native to the savannas and open woods of Mexico, the West Indies, and south to Paraguay. (Adapted from *Contributions from the National Herbarium, vol. 15, p. 115.*)

For previous introduction, see S. P. I. No. 38041.

51783. PASPALUM HUMBOLDTIANUM Fluegge. Poaceæ. Grass.

"A handsome perennial grass producing strong scaly rootstocks, with tufted culms, 40 to 80 centimeters high, erect from a woody, decumbent base. The nodes are densely bearded with upwardly appressed white hairs; the flat, spreading blades, 8 to 18 centimeters long and 8 to 15 millimeters wide, are slightly narrowed toward the base into a stiff point. The margins are usually stiffly fringed with hairs, and the panicles, 10 to 15 centimeters long, are of pale, lax, spreading spikelets, beautifully fringed with long white glistening hairs. Native to rocky ground on the highlands from central Mexico to Argentina." (*Agnes Chase.*)

For previous introduction, see S. P. I. No. 51096.

51784. PENNISETUM DURUM Beal. Poaceæ. Grass.

"*Kul-aj* (reed of cow). Very good fodder, native to Guatemala." (*Helmrich.*)

51785. RHYNCHOSPORA sp. Cyperaceæ. Sedge.

"*Cok-see* (little cutting grass)." (*Helmrich.*)

51786 to 51791.

From Bogota, Colombia. Seeds collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received November 10, 1920. Quoted notes by Mr. Popenoe.

51786. BEFARIA PHILLYREAEFOLIA Benth. Ericaceæ.

"(No. 488a. October 14, 1920. Herb. No. 1152.) From the mountains near Sibate, Cundinamarca, at an altitude of about 9,000 feet. A bushy shrub about 5 feet high, with handsome tubular flowers, deep rose-pink in color and about 1 inch in length."

51787. BERBERIS RIGIDIFOLIA H. B. K. Berberidaceæ. Barberry.

"(No. 492a. October 14, 1920. Herb. No. 1118.) From the mountains near Sibate, Cundinamarca, at an altitude of about 9,000 feet. A thorny shrub about 6 feet high, with small leaves, small deep-yellow flowers, and oval black fruits about one-fourth of an inch long. An attractive ornamental shrub, recommended for trial in the South and on the Pacific coast."

51788. ILEX sp. Aquifoliaceæ.

"(No. 494a. October 14, 1920. Herb. No. 1151.) From Sibate, Cundinamarca, altitude about 8,600 feet. A small tree wild in this region and considered worthy of trial as an ornamental plant. It has oval leaves

51786 to 51791—Continued.

about 3 inches long and produces an abundance of small berries which are first green, then cream colored, then red, and finally, when fully ripe, almost black. They are used locally for making ink. Test in Florida and on the Pacific coast."

51789. MUTISIA CLEMATIS L. f. Asteraceæ.

"(No. 487a. October 14, 1920. Herb. No. 1145.) A climbing plant, wild and cultivated around the edges of the sabana of Bogota, at altitudes of 8,500 to 9,500 feet. It reaches a height of about 20 feet. Its foliage is graceful in appearance, of a grayish green color, and the bright-crimson flowers, which suggest small single dahlias in appearance, are about 2 inches in diameter. I believe the plant is one worthy of cultivation in California and Florida, where it will probably succeed."

51790. VACCINIUM FLORIBUNDUM H. B. K. Vacciniaceæ.

"(No. 490a, October 14, 1920. Herb. No. 1155.) From the mountains near Sibate, Cundinamarca, at an altitude of about 9,400 feet. A small shrub, compact and bushy in habit, about 5 feet high, with fine leaves and small rose-pink tubular flowers."

51791. VICIA ANDICOLA H. B. K. Fabaceæ.

"(No. 489a. October 14, 1920. Herb. No. 1153.) A small, slender climber, reaching a height of 8 or 10 feet, with delicate foliage and pea-shaped, bright-blue flowers about half an inch broad. From the mountains near Sibate, Cundinamarca, at an altitude of 9,400 feet. For trial in California and Florida and perhaps in the North as an annual."

51792 and 51793.

From Darwin, Northern Territory, Australia. Seeds presented by C. E. Allen, curator, Botanic Garden. Received November 11, 1920.

51792. ANDROPOGON BOMBYCINUS R. Br. Poaceæ. **Grass.**

"Native grass, 4 to 5 feet high." (*Allen.*)

"An erect perennial grass, native to Australia, growing to a height of 2 or 3 feet, becoming rather harsh in texture when mature. The herbage is lemon scented, but readily grazed by animals when young. The grass is very conspicuous when in bloom, on account of the silvery white heads. This grass grows in various soil types, even in drifting sands, and will endure much heat and drought." (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 17035.

51793. POLLINIA ARTICULATA Trin. Poaceæ. **Grass.**

"An annual wiry delicate grass of secondary value as pasture. Widely distributed in Asia from China to India and throughout the Malay Archipelago to Australia." (*C. V. Piper.*)

51794 to 51801.

From Bogota, Colombia. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received November 18, 1920. Quoted notes by Mr. Popenoe.

51794. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

"(No. 499a. October 14, 1920.) Seeds of *durazno*, or peach. The common seedling white clingstone grown in the vicinity of Anolaima, Cundinamarca, and elsewhere on the upper slopes of the escarpment, at altitudes of 6,000 to 7,000 feet. This is a very inferior fruit, and the seeds are intended to be grown for testing as stock plants."

51795. BERBERIS QUINDUENSIS H. B. K. Berberidaceæ. **Barberry.**

"(No. 500a. October 14, 1920. Herb. No. 1154.) Seeds of *tachuelo*, from El Penon, near Sibate, Cundinamarca; altitude, 9,300 feet. An arborescent shrub or small tree, up to 20 feet high, with small, stiff, spiny, hollylike leaves, small, golden-yellow, fragrant flowers, and oval, blue-black berries about an inch long. An attractive thing, particularly when in bloom. For trial as an ornamental plant."

51794 to 51801—Continued.

51796. BROWNEA GRANDICEPS Jacq. Cæsalpiniaceæ.

"(No. 497a. October 14, 1920.) Seeds of a magnificent flowering tree, native to the Magdalena Valley in Colombia. These seeds are from Guaduas, Cundinamarca, altitude about 3,300 feet.

"The tree is not large—about 20 feet in height—but it produces flame-scarlet flowers in compact clusters (they could almost be termed heads) 6 to 8 inches long and broad. While this plant is tropical, the fact that it is grown at Guaduas makes me think that it may succeed in southern Florida."

51797. DRIMYS WINTERI Forst. Magnoliaceæ. Canelo.

"(No. 505. October 25, 1920. Herb. No. 1109.) Plants of *palo de aji*. From El Penon, near Sibate, Cundinamarca; altitude, 9,300 feet. A small tree, reaching a height of 18 feet. The leaves are long and slender, bright green above and silvery below. The flowers, which are produced in clusters about 6 inches broad, are individually an inch in diameter, double, pure white, and faintly fragrant. When crushed the leaves have a spicy odor. This is an ornamental tree worthy of trial in the lower South and on the Pacific coast."

For previous introduction, see S. P. I. No. 42869.

51798. LUPINUS CRUCKSHANKSII Hook. Fabaceæ. Lupine.

"(No. 496a. October 14, 1920. Herb. No. 1150.) Seeds of *chocho*. From a garden on the road between Sibate and El Penon; altitude, about 9,400 feet. Several species of lupine are known in Cundinamarca under this common name. Some are wild, some cultivated. The one represented by these seeds is a handsome half-woody shrub, a favorite garden plant on the sabana of Bogota. It reaches a height of about 6 feet and is usually broad and bushy in habit. Above the attractive foliage rise numerous spikes of varicolored pealike flowers. The predominant colors are blue, lilac, white, and yellow.

"To my mind, this is a plant well worth cultivating in the United States. In California and Florida it will probably grow as a perennial. It seems to me that it might be possible to cultivate it elsewhere as an annual."

For previous introduction, see S. P. I. No. 51566.

51799. TIBOUCHINA sp. Melastomaceæ.

"(No. 502. October 25, 1920. Herb. No. 1185.) Plants of *siete-cueros*. From El Penon, near Sibate, Cundinamarca; altitude, 9,300 feet. A handsome arborescent shrub, wild in several parts of Cundinamarca and cultivated in the gardens and dooryards of Bogota. It ultimately reaches about 15 feet in height and produces flowers about 2 inches across; when these first open they are purplish red in color, and as they grow older they change to bluish purple and sometimes almost to deep blue. It is a plant which merits a trial in California and Florida as an ornamental."

51800. VALLEA STIPULARIS L. f. Elæocarpaceæ.

"(No. 501a. October 25, 1920. Herb. No. 1149.) Seeds of *raque*. From Sibate, Cundinamarca; altitude, about 9,000 feet. A small tree, common in this region. It has attractive foliage and about July, August, and September produces small clusters of rose-red flowers, followed by wrinkled fruits half an inch in diameter. It is an attractive plant which should be tested in the lower South and on the Pacific coast as an ornamental tree."

51801. LASIANTHUS sp. Rubiaceæ.

"(No. 503. October 23, 1920. Herb. No. 1110.) *Clavel del monte*, from El Penon, near Sibate, Cundinamarca; altitude, 9,300 feet. A tall shrub native to this region. It produces rose-pink flowers, somewhat funnel-shaped and about 2 inches across at the mouth. It does not bloom very profusely, but is an attractive thing nevertheless and deserves a trial in the lower South and on the Pacific coast."

51802. Solanum bullatum Vell. Solanaceæ.

From Lavras, Minas Geraes, Brazil. Seeds presented by B. H. Hunnicutt. Received November 20, 1920.

A South American plant which may possibly be valuable as a forage plant, because of its large percentage of protein. The analysis of air-dried leaves and branches shows 20.88 per cent of protein in the leaves and 14.06 per cent of protein in the branches.

For previous introduction, see S. P. I. No. 42815.

51803 to 51807.

From Singapore, Straits Settlements. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received December 1, 1920. Quoted notes by Mr. Rock.

51803. Areca catechu L. Phœnicaceæ. Betel-nut palm.

"No. 11. Variety *alba*. The white-fruited betel-nut palm, cultivated only. The fruits are larger than those of the common variety of *Areca catechu*."

For previous introduction, see S. P. I. No. 51127.

51804. Artocarpus champeden (Lour.) Spreng. Moraceæ.
(*A. polyphema* Pers.)

"No. 8. A species of breadfruit cultivated for its fruits, which are oblong and about 1 foot in length. It is much in favor with the Malays. The seeds are similar to those of the jack fruit and are roasted and eaten by the natives. Propagation is by seed."

51805. Canarium rufum A. W. Benn. Balsameaceæ.

"No. 9. A tall tree of handsome proportions, producing abundant seeds. The nuts are triangular, and the seeds are eaten like those of *Canarium commune*. It is a native of the Malay Peninsula."

51806. Jagera speciosa Blume. Sapindaceæ.

"No. 3. A small tree with trilocular fruits which are borne on long pendent racemes. The tree is about 20 feet in height and quite attractive on account of the pinnate foliage and orange-red fruits. It is a native of the Malay Peninsula and New Guinea. The fruits are much sought for by the natives."

51807. Styrax benzoin Dryander. Styracaceæ.

"No. 10. A tall tree producing the gum benjamin of the Malay Peninsula. It occurs quite commonly in the lowland forests together with Dipterocarpaceæ. Native to the Malay Peninsula."

51808. Acacia sp. Mimosaceæ.

From Quito, Ecuador. Seeds presented by Ludovic Söderström, through E. W. D. Holway, University of Minnesota, Minneapolis, Minn. Received December 2, 1920.

"Seeds from a dry region in Ecuador. It was suggested that they would do well in warm parts of California and Arizona. The wood is exceedingly hard and is used for sugar-cane rollers, etc." (*Holway.*)

51809 to 51823.

From Buitenzorg, Java. Seeds presented by H. J. Wigman, jr. Received December 3, 1920.

51809. Adenanthera pavonina L. Mimosaceæ. Coral-bean tree.

The Indian barricari, the seeds of which are brilliant scarlet and are strung to form ornaments for personal adornment. In India advantage is taken of their uniformity of weight (about 4 grains each) to use them as weights. Powdered and mixed with borax they form an adhesive substance. The seeds are occasionally used as an article of food. The hard, durable heartwood is beautiful coral red when freshly cut and sometimes marked with stripes of a darker shade; after exposure it turns purple, like rosewood; it is used for house building and cabinet-making. A dye is obtained by simply rubbing the wood against a stone,

51809 to 51823—Continued.

and this is used by the Brahmins for marking their foreheads after religious bathing. (Adapted from *Maiden, Useful Native Plants of Australia, pp. 5, 369, and 637.*)

For previous introduction, see S. P. I. No. 49955.

51810. BARYXYLUM INERME (Roxb.) Pierre. Cæsalpiniaceæ.
(*Peltophorum ferrugineum* Benth.)

A large, quick-growing, symmetrical tree, with a spreading top and fine, graceful feathery foliage, indigenous to the dry regions of Ceylon and the Malay Peninsula where the rainfall varies from 50 to 70 inches. The young leaves and shoots are covered with a brown velvety tomentum. The tree flowers twice a year at irregular seasons, some specimens being in blossom while others near by are in ripe fruit. The flowers are rusty yellow, sweet scented, and borne in large erect panicles. The tree is a magnificent sight when in full bloom. It is especially suited to dry districts, but also thrives to perfection in the moist regions up to 1,800 feet. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting, pp. 299 and 452.*)

For previous introduction, see S. P. I. No. 41574.

51811. CANANGIUM ODORATUM (Lam.) Baill. Annonaceæ. Ylang-ylang.

A large, quick-growing tree, 60 to 80 feet high, native to the Philippines, Guam, and Java. The large, greenish yellow flowers are strongly scented and yield by distillation the popular perfume ylang-ylang. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting, p. 573.*)

51812. CANARIUM INDICUM Stickm. Balsameaceæ. Kanari.
(*C. commune* L.)

"A handsome Malayan shade tree bearing a stone fruit with a hard endocarp which contains one to three seeds. Fresh, mature seeds contain approximately: Water, 31.3 per cent; oil, 54.5 per cent; protein, 11 per cent; ash, 3.2 per cent; and traces of sugar. A food for infants, to prevent the formation of a firm coagulum during the digestion of cow's milk, is prepared by adding to two parts of cow's milk an emulsion consisting of 1 part ground seeds, 15 parts water, and 5 per cent milk sugar." (*W. G. Boorsma.*)

For previous introduction, see S. P. I. No. 48981.

51813. CASSIA SIAMEA Lam. Cæsalpiniaceæ.

A large, quick-growing tree, yielding hard dark timber and good fuel. It is an important timber and cabinet tree, native to Ceylon, India, and the Malay Peninsula. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting, pp. 452 and 464.*)

For previous introduction, see S. P. I. No. 42362.

51814. CHRYSOPHYLLUM CAINITO L. Sapotaceæ. Caimito.

A fairly large and handsome West Indian tree, with striking dark-green leaves which are copper colored underneath. The purplish, smooth, round fruit is four-seeded, the seeds being brown and half an inch long. In an unripe state the fruit contains a sticky white latex, but when fully matured the white, transparent, jellylike substance surrounding the seeds is sweet and agreeable. The fruit when cut across presents a stellate form, the cells with their white edible contents radiating from the central axis. The tree is well worth cultivating for ornament or shade for roadsides, etc. It thrives at Peradeniya, where it was first introduced in 1802. Propagated by seed and thrives best in deep, rich, well-drained soil. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting, p. 150.*)

For previous introduction, see S. P. I. No. 50471.

51815. DAMMARA ALBA Rumph. Pinaceæ.
(*Agathis loranthifolia* Salisb.)

A splendid tree, up to 100 feet high, with a stem reaching 8 feet in diameter, straight and branchless for two-thirds its length. It is of great

51809 to 51823—Continued.

importance on account of its yield of the transparent dammar resin extensively used for varnish. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 161.*)

For previous introduction, see S. P. I. No. 51129.

51816. DEGUELIA MICROPHYLLA (Miquel) Valet. Fabaceæ.

A tall tree, native to Sumatra and Java, with pinnate leaves and dense, erect, axillary panicles of violet-colored flowers. Of possible value as a shade tree for coffee plantations. (Adapted from *Icones Bogorienses, Jardin Botanique de Buitenzorg, vol. 2, pl. 129.*)

51817. ELAEOCARPUS ANGUSTIFOLIUS Blume. Elæocarpaceæ.

A tree native to Buitenzorg Province, with oblong-lanceolate, acuminate, serrulate leaves and short, axillary racemes of showy flowers. The fruits are globular. (Adapted from *Blume, Bijdragen tot de Flora van Nederlandsch Indië, p. 120.*)

51818. EUSIDEROXYLON ZWAGERI Teijsm. and Binn. Lauraceæ.

A large tree with wrinkled reddish bark and reddish tomentose young branches. The coriaceous oblong-elliptic leaves are shining above and glabrous below except for puberulent veins. The oblong-ovate drupes are borne in panicles. (Adapted from *Natuurkundig Tijdschrift voor Nederlandsch-Indië, vol. 25, p. 292.*)

51819. MIMUSOPS ELENGI L. Sapotaceæ.

A tree native to Ceylon. The bark is used in native medicine for decaying gums and also for snake bite. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting, p. 596.*)

For previous introduction, see S. P. I. No. 41809.

51820. MIMUSOPS KAUKI L. Sapotaceæ.

"Most of the Straits islands are covered with a valuable tree, the *Mimusops kauki*, the fruit of which is sweet and highly nutritious. In some islands the inhabitants subsist chiefly on it during one season of the year. The Mimusops grows on the mainland of the Greater and Lesser Daudai. The fruit is dried in the sun and strung for use in seasons of scarcity. Its shape and sweetness have occasioned the misnomer of 'date' among the whites." (*Gill, A Visit to New Guinea, p. 201.*)

For previous introduction, see S. P. I. No. 48011.

51821. PTEROCARPUS INDICUS Willd. Fabaceæ. **Padouk.**

A large forest tree with drooping branches, the trunk often being provided with broad buttresses. The leaves, 8 to 10 inches long, are composed of five to nine ovate leaflets 2 to 4 inches long. The standard and wings of the yellow papilionaceous flowers are fringed on the margins. The tree has been introduced as a shade tree in many tropical localities. Cups are made of the beautiful flesh-tinted wood, which turn water yellow, orange, and finally blue. The valuable timber and cabinet wood furnished by this tree shows pale red lines of growth and large conspicuous pores. (Adapted from *Annual Report of the Smithsonian Institution, 1915, p. 271.*)

51822. PTERYGOTA ALATA (Roxb.) R. Br. Sterculiaceæ.
(*Sterculia alata* Roxb.)

A large tree of the western peninsula, Sylhet, Chittagong, Pegu, and Martaban, down to Tenasserim. It is found also on the Andaman Islands. The winged seeds are sometimes eaten by the natives of Burma. They are used in Sylhet as a cheap substitute for opium. The yellowish white wood is light, coarsely fibrous, and perishable. (Adapted from *Watt, Economic Products of India, vol. 6, pt. 3, p. 360.*)

For previous introduction, see S. P. I. No. 26938.

51823. TOONA SINENSIS (Juss.) Roemer. Meliaceæ.
(*Cedrela sinensis* Juss.)

"One of four best low-growing, ornamental trees. It is said to attain a height of 70 feet in China, but the tallest I have seen in this country (at Philadelphia) is not over 40 feet. It is a comparatively rare tree on account of the difficulty in securing seed, the trees only flowering occa-

51809 to 51823—Continued.

sionally and then only sparingly. Its wood could probably be used to advantage in the manufacture of cheap furniture. All of the species are easily propagated from root cuttings." (*G. W. Oliver.*)

For previous introduction, see S. P. I. No. 50647.

51824 to 51827. TRICHOSANTHES ANGUINA L. Cucurbitaceæ.

From Calcutta, India. Seeds presented by C. C. Calder, officiating director, Botanical Survey of India. Received December 13, 1920. Quoted notes by Mr. Calder.

51824. "*Chichinga*, black variety. From Howrah district."

51825. "*Chichinga*, black, with stripes. From Howrah district."

51826. "*Chichinga*, white variety. From Howrah district."

51827. "*Chichinga*, white, with stripes. From Howrah district."

51828 and 51829. COFFEA ARABICA L. Rubiaceæ. **Coffee.**

From Aden, Arabia. Seeds presented by Addison R. Southard, American consul. Received December, 1920. Quoted notes by Mr. Southard.

51828. "*Yaffei* (so called from the name of the Aden hinterland tribe which grows most of it) is considered by some the finest of all Arabian Mocha coffees."

51829. "*Sanani* (so called from the district of Sana, capital of Yeman, where it is grown) is a second quality of Arabian Mocha coffee which comes into the market in considerable quantities."

51830. MYRCIARIA CAULIFLORA (Mart.) Berg. Myrtaceæ. **Jaboticaba.**

From Porto Alegre, Rio Grande do Sul, Brazil. Seeds presented by G. S. Froes. Received December 14, 1920.

"A Brazilian tree, up to 35 feet high, with narrowly elliptical, sharp-pointed leaves, short-pedicelled flowers produced directly from the bark of the trunk and branches, and purplish violet globose fruits half an inch to 1½ inches in diameter." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 51267.

51831. GARCINIA MANGOSTANA L. Clusiaceæ. **Mangosteen.**

From Buitenzorg, Java. Seeds presented by Dr. M. W. Docters van Leeuwen, director, Botanic Garden. Received December 14, 1920.

The mangosteen is renowned as one of the delicious fruits of the world and has been called the "queen of tropical fruits." The tree is strictly tropical and can be successfully grown only under the most favorable soil and climatic conditions.

For previous introduction, see S. P. I. No. 51200.

51832 to 51842. CROTALARIA spp. Fabaceæ.

From Gizeh, Mouderieh, Egypt. Seeds presented by Thomas W. Brown, director, Horticultural Section. Received November 6, 1920.

51832. CROTALARIA ALATA Buch.-Ham.

A suberect undershrub 1 to 2 feet high, with broad stipules forming a wing from one node nearly to the next. The pale flowers are in twos or threes on the racemes. The thin oblong obtuse leaves are 2 to 3 inches long. Native to India, from Kumaon to Assam and the Khasi Hills, ascending to 5,500 feet. (Adapted from *Hooker, Flora of British India, vol. 2, p. 69.*)

For previous introduction, see S. P. I. No. 47667.

51832 to 51842—Continued.

51833. CROTALARIA GRANTIANA Harv.

A small slender herbaceous plant with an erect, branching leafy stem, 1 foot in height. The trifoliolate leaves consist of cuneate leaflets one-half to three-fourths of an inch long and not one-sixth of an inch wide. The small, yellow, striate flowers are borne on filiform peduncles. Native to Natal. (Adapted from *Harvey and Sonder, Flora Capensis, vol. 2, p. 43.*)

For previous introduction, see S. P. I. No. 34740.

51834. CROTALARIA INCANA L.

A tropical American plant about 1 meter high, erect, branched and somewhat shrubby, and softly gray pubescent. The leaves have three elliptical leaflets. The yellow flowers, with a standard over 10 millimeters wide, are crowded in 12 to 20 flowered elongated racemes 5 to 20 centimeters long. This plant occurs in waste places throughout the Tropics and is in flower all the year. (Adapted from *Rock, Leguminous Plants of Hawaii, p. 137.*)

For previous introduction, see S. P. I. No. 47127.

51835. CROTALARIA LABURNIFOLIA L.

A low shrub with slender, elongated, terete branches, membranous, glabrous leaflets 1 to 2 inches long, and elongated, very lax, terminal and lateral racemes of bright-yellow flowers 1 inch long. The keel is very broad, with a long incurved beak. Native to the western Indian Peninsula, Ceylon, and Malakka. (Adapted from *Hooker, Flora of British India, vol. 2, p. 84.*)

For previous introduction, see S. P. I. No. 49279.

51836. CROTALARIA POLYSPERMA Kotschy.

A densely rufo-villose herbaceous plant with trifoliolate silky leaves and six to eight small, lax, long-peduncled, lateral racemes of violet-blue flowers. The standard is widely obovate, silky pubescent without, and 14 to 16 millimeters long. The wings are oblong with an obtuse tip; the apex of the keel is attenuated into an erect, somewhat obtuse beak. Native to the Nile Land, German East Africa, British East Africa, Sudan, and Eritrea. (Adapted from *Oliver, Flora of Tropical Africa, vol. 2, p. 42,* and *Journal of the Linnean Society, vol. 42, p. 321.*)

51837. CROTALARIA RETUSA L.

A handsome East Indian annual with large yellow flowers in 12-flowered terminal racemes. The large round standard is streaked at the base, and the wings are short and villous at the back. The fluted upright stem, leafy from the base, is 1½ feet high. The oblong, wedge-shaped, entire leaves are clothed beneath with short appressed hairs and are roughish with small elevated points. (Adapted from *Curtis's Botanical Magazine, pl. 2561.*)

For previous introduction, see S. P. I. No. 36969.

51838. CROTALARIA SALTIANA Andrews.

A shrub with long, upward-curving, more or less silky branches, deciduous stipules, and dense racemes of yellow flowers. The standard is elliptic-ovate, the wings oblong, and the rounded keel 9 to 11 millimeters long. The trifoliolate leaves with small obovate leaflets are silky pubescent below, glabrous or nearly so above. Native to the Sudan and southern Abyssinia. (Adapted from *Journal of the Linnean Society, vol. 42, p. 309.*)

51839. CROTALARIA SPECTABILIS Roth.

A robust undershrub 1 to 1.5 meters high, with oblong or broadly spatulate-oblong leaves which are moderately firm in texture, glabrous above, finely silky beneath, and 7.5 to 15 centimeters long. The foliaceous stipules are persistent. The yellowish purple flowers, 22 millimeters long, are in 20 to 40 flowered racemes 3 to 5 decimeters long. The plant is native to India, ascending to an altitude of 3,000 feet in Kumaon. It is cultivated as a garden flower in the Punjab, India, where it is known as *Sauni,* but it is apparently never cultivated as an agricultural product, though fiber is sometimes prepared from it. (Adapted from *Rock, Leguminous Plants of Hawaii, p. 127.*)

51832 to 51842—Continued.

51840. CROTALARIA STRIATA Schrank.

A low-growing Brazilian shrub with rounded green branches, trifoliolate subglabrous leaves, and elongated terminal racemes of numerous drooping yellow flowers. The petals are striped with deep orange-brown. The broadly oblong standard is reflexed, and the subfalcate oblong wings are less than half the length of the much-acuminated keel, which is as long as the standard. (Adapted from *Curtis's Botanical Magazine, pl. 3200.*)

For previous introduction, see S. P. I. No. 50751.

51841. CROTALARIA USARAMOENSIS Baker f.

A tall herb allied to *Crotalaria lanceolata* E. Mey. from which it differs in its shorter and wider leaflets, 4 to 6 centimeters long and 10 to 16 millimeters wide, subacuminate at the tip and cuneate at the base. The leaves are glabrous above and slightly pubescent below. The numerous yellow striated flowers are in elongated terminal racemes, 15 to 25 centimeters long. The keel is rounded and acute at the tip. Native to German East Africa. (Adapted from *Journal of the Linnean Society, vol. 42, p. 346.*)

51842. CROTALARIA RETUSA L.

An ornamental tropical annual with an acutely quadrangular branched stem, 1 foot high, entire, oval, glabrous leaves, and terminal racemes of six to eight rather large and handsome flowers resembling in color those of some species of lupine. The greenish white standard, streaked within with pale blue, is bent back, the obovate wings are yellowish white at the base, the rest deep purple; the keel is whitish, yellow at the tip. (Adapted from *Curtis's Botanical Magazine, pl. 3034.*)

51843 to 51855.

From Rawalpindi, Punjab, India. Seeds presented by R. R. Stewart. Received December 14, 1920. Quoted notes by Mr. Stewart.

51843. COTONEASTER MICROPHYLLA Wall. Malaceæ.

A dwarf, dense, usually procumbent, much-branched shrub, with hard, ovate, shining leaves half an inch long, dark green on the upper surface, pubescent or tomentose beneath. The white, solitary flowers are one-third of an inch across, and the globose, bright-red fruits are one-fourth of an inch in diameter. Native to China and the temperate Himalayas at altitudes of 4,000 to 10,000 feet. (Adapted from *Collett, Flora Simlensis, p. 173.*)

For previous introduction, see S. P. I. No. 39008.

51844. DUCHESNEA sp. Rosaceæ.

"Wild strawberry."

51845. IRIS sp. Iridaceæ. Iris.

[Received without notes.]

51846. ROSA sp. Rosaceæ. Rose.

[Received without notes.]

51847. ROSA sp. Rosaceæ. Rose.

[Received without notes.]

51848. ROSA sp. Rosaceæ. Rose.

[Received without notes.]

51849. ROSA sp. Rosaceæ. Rose.

[Received as *Rosa webbiana*, but the fruit and seeds do not agree with our material of that species.]

51850. RUBUS sp. Rosaceæ.

[Received without notes.]

51851. RUBUS sp. Rosaceæ.

[Received without notes.]

51843 to 51855—Continued.

51852. SAUSSUREA LAPPA (Decaisne) C. B. Clarke. Asteraceæ.

The aromatic root of this tall perennial, native to Kashmir, at altitudes of 8,000 to 12,000 feet, is of medicinal value. The annual export has been as much as 1,000 tons, a large portion used for incense, further as an insecticide, keeping moths from cloth. The leaves are used as an insecticide as emballage for shawls. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 492.*)

51853. VIBURNUM sp. Caprifoliaceæ.

[Received without notes.]

Viburnums are among our best ornamental shrubs, and this may be useful in breeding work if not for its own intrinsic value.

51854. VIOLA SERPENS Wall. Violaceæ. Violet.

An herbaceous perennial with lilac-colored flowers found in woods above 7,000 feet altitude in the hilly districts throughout India and in China and Java; glabrous or with scattered hairs. The stems are short but distinct, covered with withered scales, and often producing runners. The broadly ovate, deeply cordate leaves are 1 to 2 inches long. (Adapted from *Collett, Flora Simlensis, p. 40.*)

51855. VIOLA sp. Violaceæ.

[Mixed seed, received without notes.]

51856 to 51869. LOTUS spp. Fabaceæ.

From Madrid, Spain. Seeds presented by the Botanic Garden. Received November 26, 1920.

51856. LOTUS ANGUSTISSIMUS L.

A plant with upright, sometimes decumbent to ascending, slender stems. The dark-green leaves are short stalked with small leaflets, the lower rounded obovate, and the upper lanceolate to linear. The golden-yellow flowers are often reddish at the tips. Found in meadows, on roadsides, on the less salty of the salt-pasture formations with *Cynodon dactylon*, on moist salt meadows rich in humus, and also in carbonates and sulphate salts, from the Mediterranean region to Hungary and southern France. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, abt. 2, p. 685,* and *Hayek, Die Pflanzendecke Oesterreich-Ungarns, Leipsig and Vienna, pp. 159, 494.*)

51857. LOTUS ANGUSTISSIMUS GRACILIS (Waldst. and Kit.) Aschers. and Graebn.

This plant differs from the species in its ascending or partly decumbent stem 1 to 3 decimeters long, its broader, elliptic, acute stipules, and its shorter peduncles. It is also less abundant. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, abt. 2, p. 685.*)

51858. LOTUS ARABICUS L.

A kind of vetch indigenous to Egypt, where it grows along the bed of the Nile, especially above Luxor. During the first Sudanese war this species of lotus was a continual source of trouble to the military authorities, since it was frequently cropped by the transport animals at the various encampments and led to a high mortality among them. By a chemical investigation it was ascertained that the toxicity was due to the production of prussic acid when the plant was moistened with water, as the result of the interaction of a glucosid and an enzym occurring together in its cells. The glucosid (lotusin) was obtained in a pure state and shown to be a derivative of a yellow coloring matter (lotoflavin), the latter in addition to dextrose and prussic acid being produced when lotusin is hydrolyzed, either by the action of the enzym (lotase) present in the plant or by boiling it with dilute mineral acids.

The Arabs are aware that *Lotus arabicus*, which is called "klutcher" in the vernacular, is poisonous only in the immature condition and that when allowed to ripen until seeds have formed it becomes innocuous and is then available as an excellent fodder. A chemical investigation of the fully ripe plants showed that they contained none of the poison-

51856 to 51869—Continued.

ous cyanogenetic glucosid and were consequently harmless. The proportion of prussic acid obtainable from *L. arabicus* is considerable and varies from 26 per cent in the case of young plants to 32 per cent in the case of those almost mature, when the yield of acid reaches the maximum. (Adapted from *Bulletin of the Imperial Institute, London, vol. 1, p. 12.)*

51859. LOTUS CONIMBRICENSIS Brot.

A gray-green, more or less hairy plant with decumbent, ascending, or rarely erect thin stems and short-petioled leaves. The leaflets are mostly ovate-lanceolate to obovate. The ovate stipules are longer than the petiole and mostly longer than the leaflets. The small rose-colored flowers are in one-flowered inflorescences. Found in sandy regions or on grassy places on the Mediterranean coast, in the southwest parts of Provence and the Riviera. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, p. 689.*)

51860. LOTUS CYTISOIDES L.

A slightly hairy or nearly smooth plant with stipules shorter than those of *Lotus creticus*. The corolla wings are broadly obovate, entirely covering the keel. The pod, 3 to 5 centimeters long, is more or less compressed, torulosely thickened, and straight or slightly bent. Found only on the Mediterranean seacoast on rocky precipices. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, abt. 2, p. 672.*)

51861. LOTUS EDULIS L.

A more or less hairy plant with ascending or erect, rarely decumbent, branched stems, mostly 1 to 4 decimeters long. The gray-green leaflets are obovate, rarely wedge-linear, and the stipules are broad ovate to heart-shaped, oblique at the base, acute. The large yellow flowers are in heads of one to three. Found in sandy areas in the Mediterranean region only. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, abt. 2, p. 668.*)

For previous introduction, see S. P. I. No. 7731.

51862. LOTUS FILICAULIS Durieu.

A form closely allied to *Lotus corniculatus* var. *major*. It is distinguished by the elongated, thin, stiff peduncle. Native to Algeria. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, abt. 2, p. 682.*)

51863. LOTUS GEBELIA Vent.

An herbaceous plant, native to the Alps, which flowers all through the summer. The robust and almost woody stem is branched, leafy, glabrous, glaucous green, and one-fourth of a decimeter long. The ternate leaves are subtended by bracts which resemble the subsessile, entire leaflets. The flowers, 6 to 10 millimeters long, are at first crimson red, then pale rose, and finally whitish streaked with rose. At night they fold down next the petiole and are covered by the three leaflike bracts. The glabrous pods furnish a pleasantly flavored, nourishing food. (Adapted from *Ventenat, Description des Plantes Nouvelles et Peu Connues, Cultivées dans le Jardin de J. M. Cels, p. 57.*)

51864. LOTUS JACOBAEUS L.

A plant with an erect stem, linear leaves, and subterranean pods; native to the Cape Verde Islands.

51865. LOTUS LAMPROCARPUS Boiss.

A plant native to the humid grasslands of Attica, with a robust stem often 2 feet long diffusing into long branches. The lower leaves are obovate, the upper oblong-acute. The yellow flowers are clustered in heads of two or three. The narrow erect pods are shining gray, silky, and smooth. (Adapted from *Boissier, Diagnoses Plantarum Orientalium Novarum, vol. 2, no. 9, p. 33.*)

51866. LOTUS ORNITHOPODIOIDES L.

A hairy annual with branched, decumbent, or ascending, rarely erect stems, mostly 1 to 3 decimeters long. The leaflets are wedge shaped at

51856 to 51869—Continued.

the base, obovate, rhombic, the two lower smaller, like stipules, ovate-rhombic. The yellow flowers are in clusters of two to five. There are usually several pods in a cluster, 2 to 5 centimeters long. Found in grassy fields in the Mediterranean region, near the seacoast, in southern Istria, Dalmatia, Croatia, etc. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, abt. 2, p. 669.*)

For previous introduction, see S. P. I. No. 32030.

51867. LOTUS SUAVEOLENS Pers.

A slightly hairy plant with a stem which is usually well branched and nearly always decumbent. The inflorescence is mostly three to four flowered. The leaflets are obovate, wedge shaped at the base. Found in similar situations as *L. angustissimus* (which it somewhat resembles in habit) in meadows, on roadsides, on the less salty of the salt-pasture formations with *Cynodon dactylon*, on moist salt meadows rich in humus, and also in carbonates and sulphate salts, in Europe and northwestern Africa. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, abt. 2, p. 687.*)

51868. LOTUS TENUIS Waldst. and Kit.

A plant 2 to 4, rarely 8 decimeters high, smooth or nearly so, with usually many stems, decumbent or ascending or with erect branches. The leaflets, even the lower stipulelike ones, are linear-lanceolate to linear. The inflorescence is one to five flowered. This is a facultative halophyte found mostly on salty stations, on meadows, or in ravines throughout middle Europe, and in the Tyrol up to an altitude of 945 meters. It is found in swamp meadows, on salt meadows with *Plantago maritima*, on the dry salty pastures with Salicornea, on the salt steppes, and in various other halophyte formations. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 6, abt. 2, p. 683*, and *Hayek, Die Pflanzendecke Oesterreich-Ungarns, Leipsig and Vienna, pp. 20, 157, 159, and 494.*)

51869. LOTUS sp.

[Received as *Lotus articulatus*, for which a place of publication has not yet been found.]

51870 and 51871.

From Penang, Straits Settlements. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received November 30, 1920. Quoted notes by Mr. Rock.

51870. CYRTOSTACHYS LAKKA Beccari. Phœnicaceæ. Palm.

"(No. 17.) The famous 'sealing-wax palm.'"

A tall, slender, soboliferous palm with pinnatisect leaves about 4 feet long and the leaflets 20 inches long and 1 to 1¼ inches wide, green above, ashy gray beneath. The sheath is red. The small ovoid fruits are borne on stout spreading spadix branches 1 to 2 feet long. Native to the humid jungles of Singapore. (Adapted from *Hooker, Flora of British India, vol. 6, p. 414.*)

For previous introduction, see S. P. I. No. 49530.

51871. MILLETTIA ATROPURPUREA (Wall.) Benth. Fabaceæ.

"(No. 14.) A fine symmetrical tree with dark foliage and dark-red to purplish black flowers. The pods are large and contain from one to two large brown seeds. It is worthy of cultivation on account of its handsome round crown and dark foliage. A native of the Malay Peninsula and Burma."

51872 to 51885.

From Rochester, N. Y. Presented by John Dunbar, assistant superintendent, Department of Parks. Received December 3, 1920.

51872. MALUS BACCATA (L.) Moench. Malaceæ. Siberian crab apple. (*Pyrus baccata* L.)

Seeds of the variety *orthocarpa*.

51872 to 51885—Continued.

51873. MALUS FLORIBUNDA Sieb. Malaceæ. Crab apple.
(*Pyrus floribunda* Kirchn.)

Seeds of one of the handsomest of all crab apples and one of the earliest to flower. It is a broad shrub with a trunk dividing at the base into several large branches. The pink flowers, which are deep rose color in the bud, turn white before the petals fall and are produced in the greatest profusion. The dark-green foliage is abundant, but the yellow or orange-colored fruits are not much larger than peas and make little show. The origin of this plant is uncertain. It was first sent to Europe from Japan, but it is not a native of that country. It was probably introduced from China, although it does not appear to be known in China now in a wild state. (Adapted from *American Florist, vol. 46, p. 945.*)

For previous introduction, see S. P. I. No. 49135.

51874. MALUS NIEDZWETZKYANA Dieck. Malaceæ. Apple.
(*Pyrus niedzwetzkyana* Hemsl.)

Seeds of a small free-growing tree with long, straight, rather thick flowering branches and smooth, very dark purple bark. The lanceolate leaves, 3 to 5 inches long on slender petioles 1 to 2 inches long, are rather thick, stiff, and tinged red on the fruiting branches. The petiole and midrib are bright red and slightly hairy. The deep rose-purple flowers, 1 to 1½ inches long and three-fourths of an inch across, are very numerous and clustered at the ends of short, lateral branchlets. The woolly calyx is white. The pendulous conical fruits, 1¾ to 2 inches long, have crimson-purple skin and rose-purple, pleasantly flavored flesh. The wood is red also, and the leaves turn red in autumn. (Adapted from *Curtis's Botanical Magazine, pl. 7975.*)

For previous introduction, see S. P. I. No. 49037.

51875. MALUS PRUNIFOLIA (Willd.) Borkh. Malaceæ. Apple.
(*Pyrus prunifolia* Willd.)

Seeds of a small ornamental tree native to North China and southern Siberia, with beautiful white flowers 1½ inches across, in 6 to 10 flowered umbels, and smooth globose berries, 1 inch in diameter, green, amber yellow, and bright red in varying proportions. The young shoots, petioles, under surfaces of the leaves, and inflorescences are cottony. (Adapted from *Curtis's Botanical Magazine, pl. 6158.*)

For previous introduction, see S. P. I. No. 49038.

51876. POPULUS ADENOPODA Maxim. Salicaceæ. Poplar.

Cuttings of a very distinct species easily recognized by the long-acuminate, closely crenate leaves, greenish beneath, of old mature trees. The common low-level poplar of Hupeh and Szechwan and the more eastern parts of the Yangtze Valley. In western Hupeh it is very abundant in open country and woods from river level up to an altitude of 1,500 meters. It is a rather slender, shapely tree, 20 to 25 meters or more tall, with a straight trunk clear of branches for 10 to 15 meters and clothed with smooth pale-gray bark, which on old trees and near the ground becomes dark and slightly fissured. The branches are thin, ascending spreading, and form an oval crown. The leaves vary considerably in degree of pubescence, but on old trees they are glabrous at maturity. On young trees and on adventitious shoots they are densely pubescent. (Adapted from *Sargent, Plantae Wilsonianae, vol. 3, p. 23.*)

For previous introduction, see S. P. I. No. 49040.

51877. POPULUS MAXIMOWICZII A. Henry. Salicaceæ. Poplar.

Cuttings of a handsome, stately tree, the most satisfactory of the poplars, of upright, ovate outline, which comes out in foliage 10 days before other trees and is always green, the foliage hanging on as late in the season as almost any deciduous tree. It thrives on thin gravelly soil, so dry that Norway spruce and white ash could not survive on it. In favor of the tree is its rapid growth, 3 to 5 feet a year for the first eight years. Under similar conditions the Norway maple may grow 6 to 24 inches and the red oak and pin oak 12 to 30 inches. The leaf

51872 to 51885—Continued.

is rugose like that of *Rosa rugosa*, and the foliage does not drop from trees planted on gravelly soil where there is less than half an inch of rain in August. The trees at the Arnold Arboretum, now 20 years old and 35 feet high, have never been attacked by borers, and the leaves apparently have no attraction for any leaf-eating caterpillar. The fruiting catkins, 7 to 10 inches long, remain on the trees until September without opening. It is one of the few large exotic trees with deciduous leaves which can be recommended for general planting in the Northern States. (Adapted from *Garden Magazine, vol. 29, p. 38.*)

For previous introduction, see S. P. I. No. 49041.

51878. PRUNUS AMERICANA LANATA Sudworth. Amygdalaceæ. **Plum.**

Seeds of a thorny tree, 3 to 12 meters high, with ovate-serrate, very veiny leaves; the leaves, petioles, and shoots are covered with a dense, pale tomentum. Occurring sparsely in Texas on the San Antonio River and its tributaries, where the fruit is said to be yellow and less than 12 millimeters in diameter. (Adapted from *Contributions from the U. S. National Herbarium, vol. 2, p. 102.*)

51879. PRUNUS HORTULANA Bailey. Amygdalaceæ. **Wildgoose plum.**

Seeds of a vigorous tree, attaining a height of 30 feet or more, the shaggy trunk sometimes a foot in diameter, becoming furrowed in age. The bark is gray-brown, thick, and contains deposits of red cork cells which show as bright-red blotches or as thick layers when the bark is sectioned. The branches are very spreading and open, twiggy, slender, and thorny. The thin, peachlike leaves, 5 inches long and 1¾ inches wide, become leathery, smooth, and glossy above and almost glabrous below except for the pubescent veins. The white, ill-scented flowers, three-fourths of an inch across, borne on very long spurs, open after the leaves expand and bloom later than any other cultivated plum. The clingstone fruit ripens very late, is globose, oval, and 1 inch in diameter. The thick, tough, and astringent skin is yellow to red with small conspicuous dots. The golden-yellow, coarse, firm, juicy flesh is strongly aromatic, and mildly sweet. The tree is found wild in Illinois, western Kentucky, western Tennessee, Missouri, northern Arkansas, Oklahoma, and southeastern Kansas. (Adapted from *Hedrick, Plums of New York, p. 64.*)

For previous introduction, see S. P. I. No. 41704.

51880. PRUNUS MEXICANA S. Wats. Amygdalaceæ. **Plum.**

Seeds of a plant with its young branches, pedicels, and petioles canescent with a short dense subtomentose pubescence. The leaves, 2 to 3 inches long, are oblong-lanceolate, acuminate, rounded at the base, acutely toothed, puberulent above, pubescent and lighter colored beneath. The compressed-ovate fruits are on short fascicled pedicels. Found at Lerios, Coahuila, Mexico. (Adapted from *Proceedings of the American Academy, vol. 17, p. 353.*)

For previous introduction, see S. P. I. No. 32458.

51881. PRUNUS MUNSONIANA Wight and Hedrick. Amygdalaceæ. **Plum.**

Seeds of a tree, 20 to 30 feet high, with grayish brown bark, shaggy and furrowed, and spreading, slender, zigzag branches, little or not at all thorny. The leaves, bright green and lustrous above, are dull green below, and the lower surfaces of the veins are pubescent; the leaves are lanceolate to oblong-lanceolate, 4 inches long and 1¼ inches wide, with finely serrate margins. The white flowers, three-fourths of an inch across, appear before or with the leaves, late in the season, on lateral spurs. The globose, bright currant-red, clingstone fruits, an inch in diameter with conspicuous whitish dots, ripen early and have yellow, juicy, melting flesh which is fibrous, sweetish, aromatic, and good. The fruit ships and keeps well considering the juiciness of most of the varieties. One of the best known plums for home and market use; they have a sprightly vinous flavor and are pleasant to eat either out

51872 to 51885—Continued.

of hand or cooked. The trees form dense thickets in northern Texas, eastern Oklahoma, and parts of Missouri. A robust form is hardy in central New York. (Adapted from *Hedrick, Plums of New York, p. 80.*)

51882. PRUNUS REVERCHONII Sargent. Amygdalaceæ. Plum.

Seeds of a shrub sometimes 4 meters high, usually much smaller, growing in small thickets, with erect stems and slender glabrous branchlets, light orange-brown at first, bright chestnut brown, and very lustrous and marked by small orbicular white lenticels during their first year, becoming dull reddish brown the following season. When its branches are covered by its crowded clusters of white flowers 1.2 centimeters in diameter, set off by the green of the young leaves, the plant is a beautiful object and may become a valuable addition to the list of early garden shrubs. When the leaves unfold they are slightly hairy above and coated below with long matted pale hairs and at maturity are thin, yellow-green, and mostly glabrous, 4.5 to 8 centimeters long and 2 to 2.5 centimeters wide. The subglobose, red or amber fruit, 1.5 to 1.8 centimeters in diameter, has a thick skin and thin acid flesh. (Adapted from *Sargent, Trees and Shrubs, vol. 2, p. 158.*)

51883. PYRUS BETULAEFOLIA Bunge. Malaceæ. Pear.

Seeds of a tall, very handsome tree from northern China, with crowded clusters of rather small flowers which are followed by globose fruits not much larger than peas. The tree is very hardy, vigorous, and fast growing. (Adapted from *Arnold Arboretum Bulletin of Popular Information, No. 21.*)

For previous introduction, see S. P. I. No. 45822.

51884. PYRUS NIVALIS Jacq. Malaceæ. Pear.

Seeds of a small tree of sturdy habit, with its young shoots thickly covered with a white wool. The oval, entire leaves are 2 to 3 inches long. The pure white flowers, 1½ inches across, are produced in conspicuous clusters. The roundish, yellow-green fruit is 1½ inches or more in diameter. The tree is native to eastern Europe and Asia Minor, where it is sometimes more than 50 feet high. It is a very beautiful tree early in the season, owing to the pure-white shoots and abundant flowers. The tree is cultivated in France for its fruit, which is not eaten until bletted. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 289.*)

For previous introduction, see S. P. I. No. 42797.

51885. PYRUS SALICIFOLIA Pall. Malaceæ. Willow-leaved pear.

Seeds of the handsome, willow-leaved pear, native to the eastern Mediterranean region, to various parts of southern Russia, and as far north as Siberia. The round-headed tree is 20 to 25 feet high, has a short stout trunk, and bears beautiful willowlike grayish to silvery leaves 1 to 3 inches long and scarcely more than half an inch wide. The dense corymbs of white flowers are borne freely in April. (Adapted from *Gardening Illustrated, vol. 34, p. 305.*)

51886 and 51887. CITRUS spp. Rutaceæ.

From Tripoli, Libia, Africa. Budwood presented by Dr. O. Fenzi, director, Stabilimento Orticolo Libico. Received December 18, 1920. Quoted notes by Doctor Fenzi.

51886. CITRUS NOBILIS DELICIOSA (Ten.) Swingle. Mandarin orange.

"*Giant early mandarin.* A mandarin of extra superior quality, ripening as early as the end of October, with an extra large fruit, well filled, and with thin skin; the pulp is very juicy, sweet, and aromatic."

51887. CITRUS SINENSIS (L.) Osbeck. Orange.

"*Lim dem* (Tripoli blood orange), considered the very best in its section. It is generally seedless, oval in shape, with nearly brick-colored skin. Some years ago a small export was made to Hamburg and realized higher prices than any of the best Spanish or California varieties."

51888 and 51889. Hedysarum coronarium L. Fabaceæ. **Sulla.**

From Valetta, Malta. Seeds presented by the Società Economico-Agraria del Gruppo di Malta, through Carl R. Loop, American consul. Received December 18, 1920.

"Sulla is a deep-rooting perennial legume which is grown extensively in the Mediterranean region. It will withstand light frosts, but heavy freezing usually kills it back. It is adapted to deep, calcareous, well-drained soils, and requires much the same treatment as alfalfa. If sown under irrigation, about three cuttings a season may be obtained, but under ordinary conditions it will not be found so satisfactory a crop as alfalfa. The chief value of sulla lies in its use as a soil-improving crop and as hay." (*J. M. Westgate.*)

51888. *Gozo.* "An early-maturing crop." (*Loop.*)

51889. *Malta.*

51890 to 51892.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received December 22, 1920.

51890. Butia capitata pulposa (Barb.-Rodr.) Becc. Phœnicaceæ. (*Cocos pulposa* Barb.-Rodr.) Palm.

"A hardy palm from southern Brazil, belonging to the same group as the species commonly cultivated in California as *Cocos australis*, *C. yatay*, and *C. eriospatha*. The trunk is 6 to 12 feet tall by 1½ to 2 feet in diameter with rather short, abruptly arched leaves 6 to 9 feet long. The petioles are armed with stout spines. The edible fruit is yellow, about 1 inch long by 1¼ inches in diameter, and the pulp is of a texture and taste somewhat like that of the pineapple." (*C. B. Doyle.*)

For previous introduction, see S. P. I. No. 47350.

51891. Ehretia acuminata R. Br. Boraginaceæ.

A tree 30 feet high, native to Bhutan and the eastern parts of Bengal, where it flowers during the hot season. The small white flowers are clustered in distant fascicles in axillary and terminal compound panicles. The leaves are smooth, serrate, and oblong-lanceolate. The round red pulpy drupes, about the size of a pea, are considered delicious by the inhabitants of Bhutan. (Adapted from *Edwards's Botanical Register, vol. 13, p. 1097.*)

For previous introduction, see S. P. I. No. 34557.

51892. Schotia latifolia Jacq. Cæsalpiniaceæ.

An ornamental shrub with rich, beautiful foliage of reddish color when young. The flesh-colored flowers are in large panicles. Suitable to be grown in pots for blooming in conservatories and for cut flowers; can be grown in open ground wherever the lemon is hardy. (Adapted from *Southern California Acclimatizing Association, Santa Barbara, Calif., May, 1897, No. 5, p. 61.*)

For previous introduction, see S. P. I. No. 3470.

51893. Cucumis melo L. Cucurbitaceæ. **Muskmelon.**

From Teheran, Persia. Seeds presented by John L. Caldwell, American Minister. Received December 23, 1920.

"The famous Persian Ispahan melon, known locally as *Kharbuza Gorgob*. These melons are famed for their delicious sweetness." (*Caldwell.*)

51894. Avena nuda Hoejer. Poaceæ. **Naked oats.**

From Chefoo, Shantung, China. Seeds presented by A. Sugden. Received December 23, 1920.

"Fresh huskless oats of surprising weight. They must be very solid." (*Sugden.*)

51895. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Christiania, Norway. Seeds presented by Dr. N. Wille, director, Botanic Garden. Received December 14, 1920.

"*Norsk Timoteifrö.*" (*Wille.*)

A local Norse variety of timothy introduced for forage-crop investigations.

51896. COLOCASIA ESCULENTA (L.) Schott. Araceæ. **Dasheen.**

From Brooksville, Fla. Grown at the Plant Introduction Garden. Received at Washington, D. C., July 3, 1919; numbered in December, 1920.

"As grown at Brooksville in 1920, these plants of unknown origin were somewhat smaller than the Trinidad dasheen, were later in maturing than that variety, and were all in flower early in November. Leaf petioles nearly plain green, with upper part more or less shaded with maroon. Blade with very irregular petiolar spot, extending along midrib and basal veins. Inflorescence small, one to each plant. Tube of spathe 1½ inches long; limb, about 8 inches; pistillate portion of spadix, 1 inch. A 3½-inch corm tested in cooking was dry and mealy and of good flavor. This dasheen, or taro, appears to be distinct from any previously received." (*R. A. Young.*)

51897. STILLINGIA SEBIFERA (L.) Michx. Euphorbiaceæ.
(*Sapium sebiferum* Roxb.)

From San Antonio, Tex. Seeds presented by the superintendent, San Antonio Experiment Farm. Received November 10, 1920.

This tree, which occurs in all the warmer parts of China, is long lived, growing to 40 or 50 feet in height, with a diameter of 5 or 6 feet at maturity. The foliage takes on beautiful tints in autumn. The fruits are three celled, flattened-ovoid, and about three-fifths of an inch in diameter. When ripe they are blackish brown and woody in appearance and are either gathered by hand or knocked down by poles. After being collected, the fruits are spread in the sun, where they open and each liberates three elliptical seeds which are covered with a white substance. This covering is a fat or tallow and is removed by steaming and rubbing through a bamboo sieve. The fat is collected and melted, molded into cakes, and sold as the "pi-yu" of commerce. The seeds from which the fat has been removed are crushed, and the oil expressed from them is the "ting-yu" of commerce. In China the oil and tallow are used in the manufacture of candles. Both these products are also exported in quantity to Europe, where they are used in the manufacture of soap. (Adapted from *Wilson, A Naturalist in Western China, vol. 2, p. 67.*)

These seeds were collected from a tree sent to the experiment farm in 1910 under S. P. I. No. 23218.

For previous introduction, see S. P. I. No. 47363.

51898 to 52267.

From East Africa. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received October 20, 1920. Quoted notes by Doctor Shantz.

51898. ABUTILON sp. Malvaceæ.

"(No. 1294. Butiaba, Northern Province, Uganda. July 19, 1920.) A small yellow hibiscuslike flower with green foliage."

51899. ABUTILON sp. Malvaceæ.

"(No. 1325. Lur, Anglo-Egyptian Sudan. July 27, 1920.) A small wait-a-bit with a smilaxlike leaf and a yellow flower."

51900. ACACIA SCORPIOIDES (L.) W. F. Wight. Mimosaceæ.
(*A. arabica* Willd.)

"(Nos. 1528 and 1528a. Jebelein, Sennar Province, Anglo-Egyptian Sudan. August 14, 1920.) *Garat* or *garad;* acacialike plant used for tanning."

For previous introduction, see S. P. I. No. 50110.

51898 to 52267—Continued.

51901 and 51902. ALBIZZIA LEBBECK (L.) Benth. Mimosaceæ. Lebbeck tree.

51901. "(No. 1474. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) A large flat-topped acacialike tree with a very heavy crop of large, flat pods. It is grown throughout central and northeastern Africa (Nile Valley)."

For previous introduction, see S. P. I. No. 50713.

51902. "(No. 1545. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 18, 1920.) An acacialike tree which bears thin pods."

For previous introduction, see S. P. I. No. 50713.

51903. ANNONA SENEGALENSIS Pers. Annonaceæ. Custard-apple.

"(Nos. 1279 and 1279a. West of Misindi, Northern Province, Uganda. July 19, 1920.) Custard-apple. I have observed this all through Africa, but this is the first ripe fruit I have seen."

For previous introduction, see S. P. I. No. 49843.

51904. ANOGEISSUS LEIOCARPA (DC.) Guill. and Perr. Combretaceæ.

"(No. 1363. Shindurru to Nyonki, Mongalla Province, Anglo-Egyptian Sudan. July 28, 1920. Herb. No. 935.) Seed of a fine birchlike tree with the broad-spreading habit of a fig."

51905 to 51907. ARACHIS HYPOGAEA L. Fabaceæ. Peanut.

51905. "(No. 1349. Between Uma and Regu, Mongalla Province, Anglo-Egyptian Sudan. July 26, 1920.) Monkey nuts (peanuts); one of the chief crops here."

51906. "(No. 1496. Simsima, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Peanuts grown by the Bori; voandzeia is also grown."

51907. "(No. 1532. Omdurman, Khartum Province, Anglo-Egypt'an Sudan. August 18, 1920.) Peanuts; small type grown here for Egyptian market."

51908. ARISTIDA sp. Poaceæ. Grass.

"(No. 1184. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Very abundant here; of doubtful value."

51909. ASPARAGUS FALCATUS L. Convallariaceæ. Asparagus.

"(No. 1302. Panyamur, Northern Province, Uganda. July 20, 1920.) A spiny type of asparagus."

For previous introduction, see S. P. I. No. 33725.

51910. BIXA ORELLANA L. Bixaceæ. Annatto tree.

"(No. 1276. Misindi, Northern Province, Uganda. July 18, 1920.) Used as a dye plant. A very attractive shrub in central Africa."

For previous introduction, see S. P. I. No. 50222.

51911. BRACHYSTEGIA sp. Cæsalpiniaceæ.

"(No. 1278. Misindi, Northern Province, Uganda. July 18, 1920.) A beautiful Mopanelike shrub."

51912. BUTYROSPERMUM PARKII (Don) Kotschy. Sapotaceæ.

"(No. 1348. Between Uma and Regu, Mongalla Province, Anglo-Egyptian Sudan. July 26, 1920.) A large tree and one of the most valuable oil trees, from the seeds of which is obtained a solid fat called shea butter. The seeds are roasted and ground, and the oil is boiled off."

For previous introduction, see S. P. I. No. 21057.

51913 and 51914. CAJAN INDICUM Spreng. Fabaceæ. Pigeon-pea.

51913. "(No. 1267. Misindi, Northern Province, Uganda. July 17, 1920.) Pigeon-peas from the native market."

51914. "(No. 1543. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 18, 1920.) A small reddish pigeon-pea."

51898 to 52267—Continued.

51915. CARDIOSPERMUM sp. Sapindaceæ.

"(No. 1277. Misindi, Northern Province, Uganda. July 18, 1920.) A vine with a leaf similar to that of a clematis, but delicate in structure. The delicate white flower is followed by a three-sided bladder-shaped pod with one seed in the center of each of the three carpels."

51916. CARDIOSPERMUM sp. Sapindaceæ.

"(No. 1343. Between Uma and Regu, Mongalla Province, Anglo-Egyptian Sudan. July 26, 1920.) A pretty vine with a bladder-shaped pod."

51917. CASSIA sp. Cæsalpiniaceæ.

"(No. 1350. Between Uma and Regu, Mongalla Provine, Anglo-Egyptian Sudan. July 26, 1920.) A small legume with a partition between seeds."

51918. CASSIA sp. Cæsalpiniaceæ.

"(No. 1352. Between Uma and Regu, Mongalla Province, Anglo-Egyptian Sudan. July 26, 1920.) A pink-flowered legume with a leaf like a rose."

51919. CASSIA sp. Cæsalpiniaceæ.

"(No. 1420. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) A small legume which is abundant on the lowlands."

51920 and 51921. CHLORIS ABYSSINICA Hochst. Poaceæ. Grass.

51920. "(No. 1254. Namasagali, Eastern Province, Uganda. July 13, 1920.) Grass."

51921. "(No. 1415. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 3, 1920. Herb. No. 941.) Grass which is abundant in central Africa but seldom dominant."

51922. CICER ARIETINUM L. Fabaceæ. Chick-pea.

"(No. 1535. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 18, 1920.) A small chick-pea called *kob kobeek*."

51923. CITRULLUS VULGARIS Schrad. Cucurbitaceæ. Watermelon.

"(No. 1533. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 18, 1920.) Seed of a cucurbit sold in market as a food called *durum*."

51924. CLITORIA TERNATEA L. Fabaceæ.

"(No. 1502. Malek, Mongalla Province, Anglo-Egyptian Sudan. August 9, 1920.) A beautiful leguminous vine with bright-blue flowers."

For previous introduction, see S. P. I. No. 39301.

51925. COSMOS SULPHUREUS Cav. Asteraceæ. Cosmos.

"(No. 1270. Misindi, Northern Province, Uganda. July 18, 1920.) An orange-colored cosmos which forms a very pretty hedge."

For previous introduction, see S. P. I. No. 37884.

51926. CROTALARIA sp. Fabaceæ.

"(No. 1323. Suwara, Mongalla Province, Anglo-Egyptian Sudan. July 23, 1920.) A small yellow legume."

51927. CROTALARIA sp. Fabaceæ.

"(No. 1365. Near Nyonki, Mongalla Province, Anglo-Egyptian Sudan. July 28, 1920.) A small legume."

51928. CROTALARIA sp. Fabaceæ.

"(No. 1403. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) A Crotalaria with large hairy pods."

51929. CROTALARIA sp. Fabaceæ.

"(No. 1418. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 5, 1920.) A very small, yellow-flowered legume which forms dense mats or tangles of stems at the base of hills."

51930. CROTALARIA sp. Fabaceæ.

"(No. 1504. Shambe, Bahr el Ghazal Province, Anglo-Egyptian Sudan. August 10, 1920.) A blue-flowered Crotalaria with hairy pods."

51898 to 52267—Continued.

51931 and 51932. CUCUMIS METULIFERUS E. Mey. Cucurbitaceæ. **Cucumber.**

51931. "(Nos. 1295 and 1295a. Butiaba, Northern Province, Uganda. July 19, 1920.) A cucumber which is red near the tip; it ripens very unequally; is eaten by birds."

51932. "(No. 1495. Simsima, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) A wild red type of cucumber, 1¼ by 2 or 2½ inches. When ripe they are eaten by birds."

51933 and 51934. CUCUMIS SATIVUS L. Cucurbitaceæ. **Cucumber.**

51933. "(No. 1207. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Cucumber; a small type from the market."

51934. "(No. 1494. Simsima, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) A deep-green cucumber with yellow markings."

51935. CUCUMIS sp. Cucurbitaceæ.

"(No. 1330. Atokaferri, Mongalla Province, Anglo-Egyptian Sudan. July 25, 1920.) A small cucumber which is very popular with the natives of this section."

51936. CUCUMIS sp. Cucurbitaceæ.

"(No. 1417. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 4, 1920.) A large cucumber with long spines; orange color when ripe."

51937. CUCUMIS sp. Cucurbitaceæ.

"(No. 1537. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 18, 1920.) *Senat.* A cucumberlike plant from the Red Sea region; the seeds are used as food."

51938. DOLICHOS LABLAB L. Fabaceæ. **Hyacinth bean.**

"(No. 1539. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 18, 1920.) *Kascringique.* A flat bean with a large white hilum. There are also brown and black varieties."

51939. DURANTA REPENS L. Verbenaceæ.

"(No. 1275. Misindi, Northern Province, Uganda. July 18, 1920.) A beautiful white-flowered type of Duranta."

For previous introduction, see S. P. I. No. 48707.

51940 and 51941. ECHINOCHLOA PYRAMIDALIS (Lam.) Hitchc. and Chase. (*Panicum pyramidale* Lam.) [Poaceæ. **Grass.**

51940. "(No. 1414. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 3, 1920. Herb. No. 940.) A large grass which grows along watercourses and appears to extend throughout central Africa. It grows on soil a little more moist than that in which sorghum grows."

51941. "(No. 1503. Shambe, Bahr el Ghazal Province, Anglo-Egyptian Sudan. August 10, 1920.) A grass which is characteristic of the river front."

For previous introduction, see S. P. I. No. 49999.

51942 and 51943. ELEUSINE CORACANA (L.) Gaertn. Poaceæ. **Ragi millet**

51942. "(No. 1257. Jinja, Eastern Province, Uganda. July 13 1920.) Eleusine."

51943. "(No. 1264. Misindi, Northern Province, Uganda. July 17, 1920.) Eleusine from the market at Misindi."

51944 and 51945. GOSSYPIUM HIRSUTUM L. Malvaceæ. **Cotton.**

51944. "(No. 1259. Palango, Eastern Province, Uganda. July 13. 1920.) Cotton now being planted here; it is probably Nyasaland or American Upland."

51945. "(No. 1335a. Atokaferri, Mongalla Province, Anglo-Egyptian Sudan. July 25, 1920.) Cotton from a native field."

51898 to 52267—Continued.

51946 to 51949. GOSSYPIUM NANKING SOUDANENSIS Watt. Malvaceæ. Cotton.

51946. "(No. 1347. Between Uma and Regu, Mongalla Province, Anglo-Egyptian Sudan. July 26, 1920. Herb. No. 912.) Cotton."

51947. "(No. 1359. Between Shindurru and Nyonki, Mongalla Province, Anglo-Egyptian Sudan. July 28, 1920. Herb. No. 933.) Cotton; a wild plant in natural vegetation."

51948. "(No. 1366. Nyonki, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) Apparently like No. 1359 [S. P. I. No. 51947]."

51949. "(No. 1500a. Simsima, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920. Cotton grown by the natives."

51950. GOSSYPIUM sp. Malvaceæ. Cotton.

"(No. 1304. Mutu, Northern Province, Uganda. July 20, 1920.) A few seeds of cotton, probably wild."

51951. MELHANIA FERRUGINEA A. Rich. Sterculiaceæ.

"(No. 1327. Lur, Mongalla Province, Anglo-Egyptian Sudan. July 27, 1920.) A hairy-leaved plant with yellow flowers."

51952 to 52050. HOLCUS SORGHUM L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)

51952. "(No. 1209. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Kafir corn just as sold in the market."

51953. "(No. 1200. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Durra; spreading red head not as dark as No. 1197 [S. P. I. No. 51579], but much darker than No. 1198 [S. P. I. No. 51580]."

For an illustration of this and the four following sorghums, see Plate VI.

51954. "(No. 1201. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Durra; a spreading white kafirlike type."

51955. "(No. 1202. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Close, dark-red or tan-colored head, similar in color to No. 1198 [S. P. I. No. 51580]."

51956. "(No. 1203. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Durra; spreading head of light-tan color."

51957. "(No. 1204. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Durra; a very dark rather open but short-branched head."

51958. "(No. 1205. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Durra; a very dense head of red-tan color."

51959. "(No. 1266. Misindi, Northern Province, Uganda. July 17, 1920.) Kafir corn."

51960. "(No. 1301. Panyamur, Northern Province, Uganda. July 20, 1920.) Kafir corn."

51961. "(No. 1320. Suwara, Mongalla Province, Anglo-Egyptian Sudan. July 23, 1920.) Kafir corn; a small red head of m'tama."

51962. "(No. 1321. Suwara, Mongalla Province, Anglo-Egyptian Sudan. July 23, 1920.) A small, very dark head."

51963. "(No. 1322. Suwara, Mongalla Province, Anglo-Egyptian Sudan. July 23, 1920.) A lighter head, more open and spreading."

51964. "(No. 1324. Lur, Mongalla Province, Anglo-Egyptian Sudan. July 27, 1920.) A white kafir corn."

51965. "(No. 1331. Atokaferri, Mongalla Province, Anglo-Egyptian Sudan. July 25, 1920.) Kafir corn with a long, open, white head."

51966. "(No. 1332. Atokaferri, Mongalla Province, Anglo-Egyptian Sudan. July 25, 1920.) Long, open, red head."

51967. "(No. 1333. Atokaferri, Mongalla Province, Anglo-Egyptian Sudan. July 25, 1920.) Small, dense, red head."

51898 to 52267—Continued.

51968. "(No. 1334. Atokaferri, Mongalla Province, Anglo-Egyptian Sudan. July 25, 1920.) Dense, red head, not so small as the preceding number."

51969. "(No. 1335. Atokaferri, Mongalla Province, Anglo-Egyptian Sudan. July 25, 1920.) Long, tan head."

51970. "(No. 1454. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) Large, spreading head of purplish tan color; abundant."

51971. "(No. 1455. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) Spreading deep-red head; the branches of the head hang down."

51972. "(No. 1456. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) Semipendent, spreading, white head with tan-colored tips."

51973. "(No. 1457. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) White with tan tips, red hull, and semipendent branches."

51974. "(No. 1458. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) White with a tan tinge and red hull; the branches are pendent with an upright central spike."

51975. "(No. 1460. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) White with black hull; the seeds are pointed."

51976. "(No. 1461. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) Black hull, white with purple spots; a close head, but the branches stand distinct."

51977. "(No. 1462. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) Grain stained purple; dark hull; short, stubby, rather open head."

51978. "(No. 1463. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) Light-lemon grain with orange hull and rather spreading head."

51979. "(No. 1464. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) Seed light tan; very long, rather open head, similar to No. 1463 [S. P. I. No. 51978]."

51980. "(No. 1465. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) Very white head, deep-red almost black hull, plump white grain, purple tip."

51981. "(No. 1467. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) Dull tan, rather long, close head; hull orange. Weevils were at work on this while it was still standing in the field."

51982. "(No. 1467a. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) Durra."

51983. "(No. 1468. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) Light lemon-colored head and orange-colored bracts; a very fine type similar to No. 1464 [S. P. I. No. 51979]."

51984. "(No. 1469. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) A long head of deep almost reddish tan or wine color."

51985. "(No. 1470. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) A small, dense head of deep purple or wine color."

51986. "(No. 1471. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) A dense, white head with black hull, mottled with tan and purple."

51987. "(No. 1472. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 7, 1920.) A very large, dense, deep-red head with a tendency to gooseneck, which is rare here."

51898 to 52267—Continued.

51988. "(No. 1505. Tango, Upper Nile Province, Anglo-Egyptian Sudan. August 12, 1920.) Durra; a large-seeded type grown locally."

51989. "(No. 1525a. Shikaba, Upper Nile Province, Anglo-Egyptian Sudan. August 14, 1920.) Durra grown locally."

51990. "(No. 1526. Shikaba, Upper Nile Province, Anglo-Egyptian Sudan. August 14, 1920.) Red durra."

51991. "(No. 1530. Jebelein, Sennar Province, Anglo-Egyptian Sudan. August 14, 1920.) A large-seeded white durra."

51992. "(No. 1546. Atbara, Berber Province, Anglo-Egyptian Sudan. August 24, 1920.) Irrigated durra; a uniform, small-headed type."

51993. "(No. 1547. Edfou, Egypt. August 27, 1920.) Durra with very dense, uniform white heads."

51994. Variety *abyssinicus*. "(No. 1429. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Almost white awned."

51995. Variety *abyssinicus*. "(No. 1512. Taufikia, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) A light, hairy type."

51996. Variety *cordofanus*. "(No. 1508. Taufikia, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Rather hairy, awnless, light, but dark when ripe."

51997. Variety *cordofanus*. "(No. 1510. Taufikia, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Orange color, unawned except when very young; smooth."

51998. Variety *cordofanus*. "(No. 1511. Taufikia, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Similar to the preceding number."

51999. Variety *cordofanus*. "(No. 1521. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Large, light, and awned."

52000. Variety *eichengeri*. "(No. 1256. Jinja, Eastern Province, Uganda. July 13, 1920.) A small type."

52001. Variety *eichengeri*. "(No. 1309. Nimule, Mongalla Province, Anglo-Egyptian Sudan, July 22, 1920.) Awned type."

52002. Variety *eichengeri*. "(No. 1310. Nimule, Mongalla Province, Anglo-Egyptian Sudan. July 22, 1920.) Awned; rather small flower."

52003. Variety *eichengeri*. "(No. 1312. Nimule, Mongalla Province, Anglo-Egyptian Sudan. July 22, 1920.) Several small awned heads."

52004. Variety *eichengeri*. "(No. 1313. Nimule, Mongalla Province, Anglo-Egyptian Sudan. July 22, 1920.) Large awned heads."

52005. Variety *eichengeri*. "(No. 1338. Moku, Mongalla Province, Anglo-Egyptian Sudan. July 25, 1920.) Sorghum typical of this section."

52006. Variety *eichengeri*. "(No. 1357. Kirillu, Mongalla Province, Anglo-Egyptian Sudan. July 27, 1920.) A light-colored type."

52007. Variety *eichengeri*. "(No. 1361. Shindurru to Nyonki, Mongalla Province, Anglo-Egyptian Sudan. July 28, 1920.) A tall light type collected near Nyonki."

52008. Variety *eichengeri*. "(No. 1522. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Large, light, and awned."

52009. Variety *eichengeri*. "(No. 1523. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Large, light, and awned."

51898 to 52267—Continued.

52010. Variety *eichengeri*. "(No. 1524. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Large, light, and awned."

52011. Variety *eichengeri*. "(No. 1525. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Two very light, small heads."

52012 to 52014. Variety *niloticus*. "(Namasagali, Eastern Province, Uganda. July 13, 1920.) Collected near the Nile on land previously cultivated by the natives; this land naturally produces tall Cymbopogon and Panicumlike grasses. Much like the Kongo at Kabalo. The chief crop here is the banana, which is used as a vegetable and as a fruit. Eleusine, kafir corn, and corn are also grown."

52012. (No. 1239.) 52014. (No. 1249.)

52013. (No. 1248.)

52015. Variety *niloticus*. "(No. 1291. Escarpment, near Butiaba, Northern Province, Uganda. July 19, 1920. Collected between Escarpment and Butiaba (7 miles)."

52016 to 52019. Variety *niloticus*. "(Nos. 1370 to 1373. Nile bank opposite Rejaf, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) Collected in a great field of this wild grass just across from Rejaf. They probably represent types found here and should be carefully studied. Wide variation is shown, and it is doubtful if many forms occur that are not included in this set. Sorghums are not used for any purpose here by the natives."

52020. Variety *niloticus*. "(No. 1422. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Heavy head, not awned; distinct type."

52021. Variety *niloticus*. "(No. 1423. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Large, rather light, awned type; more common type along the river.

52022. Variety *niloticus*. "(No. 1431. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Dark awnless type."

52023. Variety *niloticus*. "(No. 1433. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Large, dark type."

52024. Variety *niloticus*. "(No. 1434. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Similar to No. 1433 [S. P. I. No. 52023]."

52025. Variety *niloticus*. "(No. 1448. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Heavy, dark, awnless type."

52026. Variety *niloticus*. "(No. 1449. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Sorghum."

52027. Variety *niloticus*. "(No. 1475. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Lighter than the average, but still deep red and hairy when ripe."

52028. Variety *niloticus*. "(No. 1477. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Very heavy, light hairy, not very ripe."

52029. Variety *niloticus*. "(No. 1483. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Dark colored; flowers sparse."

52030. Variety *vogelianus*. "(No. 1307. Nimule, Mongalla Province, Anglo-Egyptian Sudan. July 22, 1920.) Large flowers and head."

52031. Undescribed variety *a*. "(No. 1515. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Light."

52032. Undescribed variety *a*. "(No. 1517. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Darker than No. 1515 [S. P. I. No. 52031]."

51898 to 52267—Continued.

52033. Undescribed variety *a*. "(No. 1518. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920. Herb. No. 967.) Darker than No. 1515 [S. P. I. No. 52031]."

52034. Undescribed variety *b*. "(No. 1520. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Small, dark."

52035. Undescribed variety *c*. "(No. 1389. Nile bank opposite Rejaf, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) Collected in a field just across from Rejaf."

52036. Undescribed variety *c*. "(No. 1392. Nile bank opposite Rejaf, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) Collected in a field just across from Rejaf."

52037. Undescribed variety *d*. "(No. 1476. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Very dark and very hairy."

52038. Undescribed variety *d*. "(No. 1478. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Dark with white hairs."

52039. Undescribed variety *d*. "(No. 1479. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Heavy; light-red chaff."

52040. Undescribed variety *d*. "(No. 1480. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Heavy; light-red chaff."

52041. Undescribed variety *d*. "(No. 1481. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Very light color; heavy flower."

52042. Undescribed variety *d*. "(No. 1482. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Very light color; heavy flower."

52043. Undescribed variety *d*. "(No. 1484. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Deep reddish even when young; large flower."

52044. Undescribed variety *d*. "(No. 1485. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Deep reddish even when young; large flower."

52045. Undescribed variety *d*. "(No. 1486. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Rather light, hairy; hull reddish."

52046. Undescribed variety *d*. "(No. 1487. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Rather light, hairy; hull reddish."

52047. Undescribed variety *e*. "(No. 1311. Nimule, Mongalla Province, Anglo-Egyptian Sudan. July 22, 1920.) Awnless; heavy head."

52048. Undescribed variety *e*. "(No. 1308. Nimule, Mongalla Province, Anglo-Egyptian Sudan. July 22, 1920.) Awnless; small head, large flower."

52049. Undescribed variety *e*. "(No. 1369. Nile bank opposite Rejaf, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) Collected in a field just across from Rejaf."

52050. Undescribed variety *f*. "(No. 1374. Nile bank opposite Rejaf, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) Collected in a field just across from Rejaf."

52051. HOLCUS SORGHUM DRUMMONDII (Nees) Hitchc. Poaceæ.
Chicken corn.

"(No. 1506. Taufikia, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920. Herb. No. 958.) Black-seeded type of sorghum."

51898 to 52267—Continued.

52052 to 52087. HOLCUS SORGHUM EFFUSUS (Hack.) Hitchc. Poaceæ. **Kamerun grass.**

52052. "(No. 1212. Kampala, Buganda Province, Uganda. July 12, 1920.) A small type of sorghum; many of the plants are not over a foot high; may be distinct."

52053. "(No. 1221. Jinja, Eastern Province, Uganda. July 13, 1920.) Sorghum."

52054. "(No. 1223. Namasagali, Eastern Province, Uganda. July 13, 1920.) Light, small-seeded type."

52055. "(No. 1231. Namasagali, Eastern Province, Uganda. July 13, 1920.) A rather dark type."

52056 to 52063. "(Nos. 1232, 1236, 1240, 1241, 1243, 1246, 1247, 1250. Namasagali, Eastern Province, Uganda. July 13, 1920.) All these numbers were collected near the Nile on land previously cultivated by the natives, the soil naturally producing tall Cymbopogon and Panicumlike grasses, much like the Kongo at Kabalo. The chief crop here is the banana, which is used as a vegetable and as a fruit. Eleusine, kafir, and corn are also grown."

52064. "(No. 1314. Nimule, Mongalla Province, Anglo-Egyptian Sudan. July 22, 1920.) Large, awned heads."

52065 to 52067. "(Nos. 1336, 1337, 1340.) Moku, Mongalla Province, Anglo-Egyptian Sudan. July 25, 1920.) Sorghum heads typical of this section."

52068. "(No. 1353. Kirillu, Mongalla Province, Anglo-Egyptian Sudan. July 27, 1920.) Sorghum; awned and rather light."

52069. "(No. 1354. Kirillu, Mongalla Province, Anglo-Egyptian Sudan. July 27, 1920.) Similar to the preceding number."

52070. "(No. 1355. Kirillu, Mongalla Province, Anglo-Egyptian Sudan. July 27, 1920.) Similar to the preceding number; a slender reddish type."

52071. "(No. 1356. Kirillu, Mongalla Province, Anglo-Egyptian Sudan. July 27, 1920.) A light-colored type."

52072. "(No. 1360. Shindurru to Nyonki, Mongalla Province, Anglo-Egyptian Sudan. July 28, 1920.) Sorghum collected near Shindurru."

52073 to 52086. "(Nos. 1376–1380, 1384, 1386, 1388, 1390, 1393, 1394, 1396–1398. Nile bank, opposite Rejaf, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) All these sorghums were collected in a great field of this wild grass just across from Rejaf. They probably represent types found here and should be carefully studied. Wide variation is shown, and it is doubtful whether many forms occur that are not included in this set. Sorghums are not used for any purpose here by the natives."

52087. "(No. 1519. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Small dark sorghum."

52088 to 52118. HOLCUS SORGHUM EXIGUUS (Forsk.) Hitchc. Poaceæ. **Tunis grass.**

52088. "(No. 1286. Escarpment, near Butiaba, Northern Province, Uganda. July 19, 1920.) Sorghum collected between Escarpment and Butiaba (7 miles)."

52089. "(No. 1287. Escarpment, near Butiaba, Northern Province, Uganda. July 19, 1920.) Sorghum collected between Escarpment and Butiaba (7 miles)."

52090 to 52092. "(Nos. 1400–1402. Nile bank opposite Rejaf, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) Sorghums collected in a great field of wild grass just across from Rejaf. They probably represent types found here and should be carefully studied. Wide variation is shown, and it is doubtful if many forms occur that are not included in this set. Sorghums are not used for any purpose here by the natives."

51898 to 52267—Continued.

52093. "(No. 1424. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Similar to No. 1423 [S. P. I. No. 52021]."

52094. "(No. 1425. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Similar to No. 1423 [S. P. I. No. 52021]."

52095. "(No. 1426. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Deep-red awned type."

52096. "(No. 1427. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Rather light, awned type."

52097. "(No. 1428. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Similar to No. 1427 [S. P. I. No. 52096]."

52098. "(No. 1430. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Rather light, hairy, awned."

52099. "(No. 1432. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Awned, rather light type."

52100. "(No. 1435. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Rather red, awned, hairy type."

52101. "(No. 1436. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Rather light, awned, hairy type."

52102. "(No. 1437. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Purplish, awned, hairy type."

52103. "(No. 1438. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Dark, awned, hairy type."

52104. "(No. 1439. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Light, awned, hairy type."

52105. "(No. 1440. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Light, awned, hairy type."

52106. "(No. 1441. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Dense head; reddish, awned, hairy."

52107. "(No. 1442. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Similar to the preceding number, but with a more open head."

52108. "(No. 1443. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Similar to the preceding number."

52109. "(No. 1444. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Reddish, awned, hairy type."

52110. "(No. 1445. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Awned, hairy, and a little darker than the preceding number."

52111. "(No. 1446. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Same as the preceding number."

52112. "(No. 1447. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Very dark, awned."

52113. "(No. 1450. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Red, awned, hairy."

52114. "(No. 1451. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Black seed, awned, hairy."

52115. "(No. 1452. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) A hairy, awned type."

52116. "(No. 1473. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 6, 1920.) Wild sorghum seeds collected in bulk from hundreds of plants along the river flats. It should reproduce for us practically all types found here."

52117. "(No. 1507. Taufikia, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920. Herb. No. 959.) A light type of sorghum, hairy, and small awned."

51898 to 52267—Continued.

52118. "(No. 1509. Taufikia, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Glaucous, red or orange, unawned; a striking type."

52119 to 52166. HOLCUS SORGHUM VERTICILLIFLORUS (Steud.) Hitchc. [Poaceæ. **Tabucki grass.**

52119. "(No. 1223. Namasagali, Eastern Province, Uganda. July 13, 1920.) Light, small-seeded type."

52120. "(No. 1224. Namasagali, Eastern Province, Uganda. July 13, 1920.) Dark, small-seeded type."

52121. "(No. 1225. Namasagali, Eastern Province, Uganda. July 13, 1920.) Rather light."

52122. "(No. 1226. Namasagali, Eastern Province, Uganda. July 13, 1920.) Rather light."

52123. "(No. 1227. Namasagali, Eastern Province, Uganda. July 13, 1920.) A black-seeded type."

52124. "(No. 1228. Namasagali, Eastern Province, Uganda. July 13, 1920.) Heavy, black type."

52125. "(No. 1229. Namasagali, Eastern Province, Uganda. July 13, 1920.) Slender, black seed."

52126. "(No. 1230. Namasagali, Eastern Province, Uganda. July 13, 1920.) Large, heavy type."

52127 to 52138. "(Nos. 1232a, 1233, 1234, 1235, 1237, 1238, 1242, 1244, 1245, 1251–1253. Namasagali, Eastern Province, Uganda. July 13, 1920.) These numbers were collected near the Nile on land which naturally produces tall Cymbopogon and Panicumlike grasses, previously cultivated by the natives. Much like the Kongo at Kabalo. The chief crop here is the banana, which is used as a vegetable and as a fruit. Eleusine and kafir corn are also grown."

52139. "(No. 1255. Jinja, Eastern Province, Uganda. July 13, 1920.) Sorghum; a small type."

52140. "(No. 1258. Jinja, Eastern Province, Uganda. July 13, 1920.) A small type."

52141. "(No. 1260. Misindi Port, Northern Province, Uganda. July 16, 1920.) Sorghum abundant along the road."

52142. "(No. 1271. Misindi, Northern Province, Uganda. July 18, 1920.) A dark type."

52143. "(No. 1272. Misindi, Northern Province, Uganda. July 18, 1920.) A rather light hairy type with very dark seed."

52144. "(No. 1273. Misindi, Northern Province, Uganda. July 18, 1920.) A tall, dark type."

52145. "(No. 1281. Escarpment, near Butiaba, Northern Province, Uganda. July 19, 1920.) Sorghum."

52146 to 52151. "(Nos. 1283, 1284, 1285, 1288, 1289, 1290. Escarpment, near Butiaba, Northern Province, Uganda. July 19, 1920.) These numbers were collected between Escarpment and Butiaba (7 miles)."

52152. "(No. 1319. Suwara River, Mongalla Province, Anglo-Egyptian Sudan. July 23, 1920.) Sorghum about 12 feet high."

52153. "(No. 1339. Moku, Mongalla Province, Anglo-Egyptian Sudan. July 25, 1920.) Sorghum, typical of this section."

52154 to 52162. "(Nos. 1375, 1381, 1382, 1383, 1385, 1387, 1391, 1395, 1399. Nile bank opposite Rejaf, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) Sorghums collected in a great field of this wild grass just across from Rejaf. They probably represent types found here and should be carefully studied. Wide variation is shown, and it is doubtful if many forms occur that are not included in this set. Sorghums are not used for any purpose here by the natives."

51898 to 52267—Continued.

52163. "(No. 1404. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) A dark head."

52164. "(No. 1405. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) A light head."

52165. "(No. 1406. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) Intermediate between Nos. 1404 and 1405 [S. P. I. Nos. 52163 and 52164]."

52166. "(No. 1516. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Darker than No. 1515 [S. P. I. No. 52031]."

52167. HORDEUM VULGARE PALLIDUM Seringe. Poaceæ. **Barley.**

"(No. 1534. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 14, 1920.) Barley."

52168. IPOMOEA sp. Convolvulaceæ. **Morning-glory.**

"(No. 1211. Entebbe, Buganda Province, Uganda. July 12, 1920.) A very attractive large-flowered ornamental shrub abundant at Kisumu."

52169. IPOMOEA sp. Convolvulaceæ. **Morning-glory.**

"(No. 1499. Simsima, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Wild morning-glory; did not see it in flower. Probably an annual."

52170. KIGELIA PINNATA (Jacq.) DC. Bignoniaceæ.

"(No. 1544. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 18, 1920.) 'Sausage tree,' one of the most common African trees; used as a street tree here in Khartum."

For previous introduction, see S. P. I. No. 38698.

52171. LEPTOCHLOA sp. Poaceæ. **Grass.**

"(No. 1292. Escarpment, near Butiaba, Northern Province, Uganda. July 19, 1920.) A tall grass found just below Escarpment."

52172. LUPINUS TERMIS Forsk. Fabaceæ. **Lupine.**

"(No. 1538. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 18, 1920.) A large, white-seeded legume."

52173. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

"(No. 1341. Moku, Mongalla Province, Anglo-Egyptian Sudan. July 25, 1920.) Tomato grown at Liri. Collected July 21, 1920."

52174. MANISURIS EXALTATA (L. f.) Kuntze. Poaceæ. **Grass.**
(*Rottboellia exaltata* L. f.)

"(No. 1514. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) A few ripe seeds of a grass very abundant throughout central Africa."

52175. MOMORDICA sp. Cucurbitaceæ.

"(No. 1344. Between Uma and Regu, Mongalla Province, Anglo-Egyptian Sudan. July 26, 1920.) An orange-colored cucurbit with processes (similar to a rambutan in appearance)."

52176. MORINGA OLEIFERA Lam. Moringaceæ. **Horse-radish tree.**
(*M. pterygosperma* Gaertn.)

"(No. 1315. Nimule, Mongalla Province, Anglo-Egyptian Sudan. July 22, 1920.) An ornamental white-flowered tree with long three-sided pods with a single row of winged seeds."

For previous introduction, see S. P. I. No. 46386.

52177. NICOTIANA TABACUM L. Solanaceæ. **Tobacco.**

"(No. 1261. Near Atura, Eastern Province, Uganda. July 16, 1920.) Tobacco grown by the natives at a wood station."

52178. PANICUM sp. Poaceæ. **Grass.**

"(No. 1293. Escarpment, near Butiaba, Northern Province, Uganda. July 19, 1920.) Tall, coarse grass, mostly in thickets."

51898 to 52267—Continued.

52179. PANICUM sp. Poaceæ. **Grass.**

"(No. 1303. Panyamur, Northern Province, Uganda. July 20, 1920.) A grass which forms the zone next to the water's edge."

52180. PARKINSONIA ACULEATA L. Cæsalpiniaceæ.

"(No. 1513. Malakal, Upper Nile Province, Anglo-Egyptian Sudan. August 13, 1920.) Seed of a prominent street tree; the leaflets are very small, almost nothing left but the midrib."

For previous introduction, see S. P. I. No. 48176.

52181. PENNISETUM GLAUCUM (L.) R. Br. Poaceæ. **Pearl millet.** (*P. typhoideum* Rich.)

"(No. 1541. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 18, 1920.) Pennisetum."

52182. PENNISETUM PURPUREUM Schumach. Poaceæ. **Grass.**

"(No. 1214. Port Bell, Buganda Province, Uganda. July 13, 1920.) Elephant grass; used like bamboo, for building houses. A house can be built from grass covering the area of its foundation and extending 6 feet around. It supplies material both for sides and roof. This grass is also used to make paper and is eaten by elephants and buffalo. It grows on good soil."

52183. PENNISETUM sp. Poaceæ. **Grass.**

"(No. 1362. Shindurru to Nyonki, Mongalla Province, Anglo-Egyptian Sudan. July 28, 1920.) A tall Chaetochloalike grass."

52184 and 52185. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean.**

52184. "(No. 1497. Simsima, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Small green bean commonly grown by the Bori."

52185. "(No. 1208a. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Beans from the market."

52186 to 52209. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

"(No. 1265. Misindi, Northern Province, Uganda. July 17, 1920.) Beans from the market."

52186. 1. Small black beans about twice as long as wide.

52187. 2. Long maroon beans with small cream-colored flecks.

52188. 3. Long gray beans with small white flecks and dark ring around the hilum.

52189. 4. Short lavender beans with dark ring.

52190. 5. Short drab beans with dark ring.

52191. 6. Short light-brown beans with dark ring.

52192. 7. Short light-green beans with brown ring.

52193. 8. Short greenish tan beans with brown ring.

52194. 9. Long yellowish tan beans with dark ring.

52195. 10. Long tan beans with dark-brown ring.

52196. 11. Large long red beans.

52197. 12. Long narrow light-red beans.

52198. 13. Light-pink beans with stripes and flecks of maroon.

52199. 14. Small flat dull-tan beans.

52200. 15. Light and dark tan beans with dark stripes.

52201. 16. Long cream beans with dark-red mark through hilum.

52202. 17. Long broad white beans.

52203. 18. Small short white beans.

52204. 19. "(No. 1208b. Kisumu, Nyanza Province, Kenia. July 11, 1920.)" A broad flat white bean.

52205. 20. "(No. 1208c.)" Brownish tan with stripes and flecks of maroon.

52206. 21. "(No. 1208d.)" Small long narrow black beans.

52207. 22. "(No. 1208e.)" Large long narrow red beans.

51898 to 52267—Continued.

52208. 23. "(No. 1208f.)" Gray and tan with various stripes and spots.

52209. 24. "(No. 1208g.)" Long narrow beans with light-brown color overlaid with darker stripes and flecks.

52210. PHOENIX RECLINATA Jacq. Phœnicaceæ. Palm.

"(No. 1217. Port Bell, Buganda Province, Uganda. July 13, 1920.) A wild date palm; one of the most graceful African palms."

For previous introduction, see S. P. I. No. 51234.

52211. RHAMPHICARPA FISTULOSA (Hochst.) Benth. Scrophulariaceæ.

"(No. 1416. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 5, 1920. Herb. No. 937.) A plant that resembles a larkspur, but with a small white flower like a petunia. It should be an excellent annual border plant; it grows on rocks at the edge of tall grass. The flower is three-fourths of an inch across and produces an abundance of seeds."

52212 and 52213. RICINUS COMMUNIS L. Euphorbiaceæ. Castor-bean.

52212. "(No. 1346. Between Uma and Regu, Mongalla Province, Anglo-Egyptian Sudan. July 26, 1920.) A small type grown about native huts."

52213. "(No. 1421. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 5, 1920.) Ricinus."

52214. RUBUS sp. Rosaceæ. Raspberry.

"(No. 1290. Near the forest of Budongo, Northern Province, Uganda. July 19, 1920.) A red raspberry; a very good fruit."

52215. SACCHARUM SPONTANEUM L. Poaceæ. Grass.

"(No. 1318. Suwara River, Mongalla Province, Anglo-Egyptian Sudan. July 23, 1920.)"

For previous introduction, see S. P. I. No. 33257.

52216. SCLEROCARYA CAFFRA Sond. Anacardiaceæ.

"(No. 1317. Nimule to Suwara, Mongalla Province, Anglo-Egyptian Sudan. July 23, 1920.) *Mongo;* a round or globular lime-colored fruit, about 2 inches in diameter, with a very thick skin and a sweet agreeable taste. The seed has many fibers extending outside. *Mungo* is a name used in the Kongo at Kabalo."

For previous introduction, see S. P. I. No. 49315.

52217 to 52219. SESAMUM ORIENTALE L. Pedaliaceæ. Sesame.

52217. "(No. 1268. Misindi, Northern Province, Uganda. July 17, 1920.) Sesame."

52218. "(No. 1498. Simsima, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Sesame grown by Bori."

52219. "(No. 1305. Panyamur, Northern Province, Uganda. July 20, 1920.) Native-grown sesame."

52220 and 52221. SOLANUM NAUMANNI Engl. Solanaceæ.

52220. "(No. 1262. Misindi Port, Northern Province, Uganda. July 16, 1920.) An eggplant as red as a tomato, but pointed at the tip; from the market at Misindi."

52221. "(No. 1263. Misindi Port, Northern Province, Uganda. July 16, 1920.) An eggplant as red as a tomato, but rounded at the tip; from the market at Misindi."

52222. SOLANUM MELONGENA L. Solanaceæ. Eggplant.

"(No. 1501. Tombe, Mongalla Province, Anglo-Egyptian Sudan. August 9, 1920.) A white or very light green eggplant about 4 to 5 inches long and long obovoid in shape."

52223. SPOROBOLUS FIMBRIATUS Nees. Poaceæ. Grass.

"(No. 1006. Uaso Nyiro River, Kenia. July 28, 1920.) A tall grass which seems valuable and is abundant along the banks of the river; it is eaten by wild game. It may withstand small amounts of black alkali."

51898 to 52267—Continued.

52224. SPOROBOLUS INDICUS (L.) R. Br. Poaceæ. **Grass.**

"(No. 1345. Between Uma and Regu, Mongalla Province, Anglo-Egyptian Sudan. July 26, 1920.) A tall grass."

For previous introduction, see S. P. I. No. 51160.

52225. TRICHILIA sp. Meliaceæ.

"(No. 1358. Kirillu, Mongalla Province, Anglo-Egyptian Sudan. July 27, 1920.) A large tree with tricarpellate pods; the seed is red with dark spots. In the Kongo region this is known as *kihellahella*."

52226. TRICHODESMA ZEYLANICUM (Burm. f.) R. Br. Boraginaceæ.

"(No. 1326. Lur, Mongalla Province, Anglo-Egyptian Sudan. July 27, 1920.) A small borage with rather pretty flowers."

52227. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.**
(*T. vulgare* Vill.)

"(No. 1536. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 18, 1920.) Wheat (Mugami)."

52228. URENA LOBATA L. Malvaceæ.

"(No. 1274. Misindi, Northern Province, Uganda. July 18, 1920.) A plant with a small light-pink flower 1 inch in diameter."

For previous introduction, see S. P. I. No. 50089.

52229. VIGNA CYLINDRICA (Stickm.) Skeels. Fabaceæ. **Catjang.**

"(No. 1328. Lur, Mongalla Province, Anglo-Egyptian Sudan. July 27, 1920.) A small Vigna cultivated by the natives and eaten green or ripe."

52230 to 52232. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

52230. "(No. 1208h. Kisumu, Nyanza Province, Kenia. July 11, 1920.)" A small dull-red variety.

52231. "(No. 1208i. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Medium-sized clay-colored and white seeds."

52232. "(No. 1540. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 18, 1920.) *Luba* or *Hena theil;* a small bean."

52233. VIGNA sp. Fabaceæ.

"(No. 1194. Kisumu, Nyanza Province, Kenia. July 11, 1920.) A Vigna with a small hairy pod; it is a very poor seed producer."

52234. VIGNA sp. Fabaceæ.

"(No. 1219. Jinja, Eastern Province, Uganda. July 13, 1920.) A Vigna with velvet pods and blue flowers."

52235. VIGNA sp. Fabaceæ.

"(No. 1220. Jinja, Eastern Province, Uganda. July 13, 1920.) A Vigna with smooth pods and leaves and yellow flowers."

52236. VIGNA sp. Fabaceæ.

"(No. 1351. Regu, Mongalla Province, Anglo-Egyptian Sudan. July 27, 1920.) A Vigna with long narrow pods."

52237. VIGNA sp. Fabaceæ.

"(No. 1364. Near Nyonki, Mongalla Province, Anglo-Egyptian Sudan. July 28, 1920.) A wild Vigna similar to No. 1351 [S. P. I. No. 52236]."

52238 to 52254. ZEA MAYS L. Poaceæ. **Corn.**

52238. "(No. 1206. Kisumu, Nyanza Province, Kenia. July 11, 1920.) Corn from a native field. This ear is small, but large ones are produced."

52239. "(No. 1208j. Kisumu, Nyanza Province, Kenia. July 11, 1920.) From the market." Broad, flat, cream-colored kernels.

52240. "(No. 1296. Mahagi, Ituri Province, Belgian Kongo, on Lake Albert. July 20, 1920.) Yellow flint with a few dark kernels."

52241. "(No. 1297. Mahagi, Ituri Province, Belgian Kongo, on Lake Albert. July 20, 1920.) Red and deep-red kernels in thick irregular rows."

51898 to 52267—Continued.

52242. "(No. 1298. Mahagi, Ituri Province, Belgian Kongo, on Lake Albert. July 20, 1920.) A dark-blue ear with a few yellow kernels."

52243. "(No. 1299. Mahagi, Ituri Province, Belgian Kongo, on Lake Albert. July 20, 1920.) Deep red in irregular rows."

52244. "(No. 1300. Mahagi, Ituri Province, Belgian Kongo, on Lake Albert. July 20, 1920.) Purple and yellow."

52245. "(No. 1408. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 3, 1920.) All native yellow flint."

52246. "(No. 1409. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 3, 1920.) Yellow flint with starch tips to many of the kernels."

52247. "(No. 1410. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 3, 1920.) White flint."

52248. "(No. 1411. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 3, 1920.) Yellow and white flint mixed."

52249. "(No. 1412. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 3, 1920.) A small white waxy ear."

52250. "(No. 1413. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 3, 1920.) A red ear."

52251. "(No. 1490. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Red ear."

52252. "(No. 1491. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) Yellowish."

52253. "(No. 1492. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) White flint."

52254. "(No. 1493. Mongalla, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) White flint with purple cob."

52255. ZIZIPHUS MUCRONATA Willd. Rhamnaceæ.

"(No. 1542. Omdurman, Khartum Province, Anglo-Egyptian Sudan. August 18, 1920.) Edible Ziziphus sold in the market."

52256. (Undetermined.)

"(No. 1213. Kampala, Buganda Province, Uganda. July 12, 1920.) A leguminous plant with pink flowers. It is quite abundant here and may be useful as a cover crop."

52257. (Undetermined.)

"(No. 1215a. Port Bell, Buganda Province, Uganda. July 13, 1920.) A bean with small clustered flowers and pods. Very abundant in central Africa."

52258. (Undetermined.)

"(No. 1216. Port Bell, Buganda Province, Uganda. July 13, 1920.) A legume; a very small form which may be good for citrus orchards."

52259. (Undetermined.)

"(No. 1269. Misindi, Northern Province, Uganda. July 17, 1920.) Fruit eaten by baboons in Bodongo forest."

52260. (Undetermined.)

"(No. 1282. Escarpment near Butiaba, Northern Province, Uganda. July 19, 1920.) A small Rhuslike tree with pretty foliage and berries."

52261. (Undetermined.)

"(No. 1316. Nimule, Mongalla Province, Anglo-Egyptian Sudan. July 22, 1920.) A small leguminous shrub or low bush."

52262. (Undetermined.)

"(No. 1329. Lur, Mongalla Province, Anglo-Egyptian Sudan. July 27, 1920.) A fruiting vine similar to Strychnos; the fruit is eaten by birds."

52263. HEDYOTIS sp. Rubiaceæ.

"(No. 1367. Nyonki, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) A plant with a small starlike flower with a very long tube."

51898 to 52267—Continued.

52264. (Undetermined.)

"(No. 1368. Nyonki, Mongalla Province, Anglo-Egyptian Sudan. July 29, 1920.) A long, red, gradually pointed cucumber."

52265. (Undetermined.)

"(No. 1419. Rejaf, Mongalla Province, Anglo-Egyptian Sudan. August 5, 1920.) A cucurbit; eaten by birds. The smooth fruit is reddish when ripe and very bitter when green."

52266. (Undetermined.)

"(No. 1500. Simsima, Mongalla Province, Anglo-Egyptian Sudan. August 8, 1920.) A small red fruit which seems to be a cucurbit. There are two seeds in each fruit. It is valuable as an ornamental, but is not eaten."

52267. (Undetermined.)

"(No. 1529. Shikaba, Upper Nile Province, Anglo-Egyptian Sudan. August 14, 1920.) *Mahaleb;* black shiny seed."

52268. Paulownia fortunei (Seem.) Hemsl. Scrophulariaceæ.

From Taihoku, Taiwan, Japan. Seeds presented by R. Kanehira, director, Experimental Station of Forestry. Received December 17, 1920.

This tree is originally from eastern China. The elongated calyxes are glabrous and shining, except around the upper edge, which is yellowish pubescent. The tree does not attain the height of *Paulownia tomentosa*, but the whitish, spotted flowers are larger than those of *P. tomentosa*. The leaves are much longer and covered beneath with a short, dense, white pubescence. (Adapted from *Bulletin de la Société Dendrologique de France, 1908, p. 162.*)

For previous introduction, see S. P. I. No. 47164.

52269 to 52280. Vicia spp. Fabaceæ. Vetch.

From Erfurt, Germany. Seeds purchased from Haage & Schmidt. Received December 21, 1920.

52269. Vicia atropurpurea Desf. Purple vetch.

"The *purple vetch* is indigenous to the Mediterranean region. It is a viny annual which under favorable circumstances makes a stem growth of 4 or 5 feet. It is slightly less winter hardy than common vetch (*Vicia sativa*) and is adapted for growing as a winter annual only in the milder parts of the United States. It is especially valuable for green manure in the southwestern United States. Its seed habits are good, and it is also desirable as a hay and pasture crop." (*Roland McKee.*)

52270. Vicia cracca L.

"*Tufted vetch.* Occurs as a native in America, as well as in Europe and Asia. It is a perennial with slender viny stems which under favorable circumstances attain a height of 3 feet. The seed habits are poor and the seed is difficult to harvest. It is relished by all kinds of stock and is considered valuable pasturage. The good qualities of this vetch make it worthy of attention as a crop to be grown under cultivation." (*Roland McKee.*)

52271. Vicia hirsuta (L.) S. F. Gray.

A sparsely hardy annual with several prostrate or climbing slender knotty stems, 2 to 6 decimeters high, sometimes shorter, square ridged. The sessile leaves consist of 6 to 10 pairs of short, linear leaflets; the lower leaves are elliptic, notched at the edge, mostly 1 to 2 centimeters long and 1 to 2 millimeters wide. The inflorescence, 3 to 4 millimeters long, mostly 3 to 8 flowered, has a short, bearded tip. The flowers are bluish white. Found in grasslands, thickets, and steppe formations throughout middle Europe, also in the islands of the North Sea. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, p. 906.*)

52269 to 52280—Continued.

52272. VICIA HYBRIDA L.

"An annual vetch, native to the Mediterranean region and requiring about the same climatic conditions as the common vetch (*Vicia sativa*). It is a less vigorous grower than either common or hairy vetch (*V. villosa*) and for this reason less well adapted for growing under cultivation. However, it may be of value for pasturage." (*Roland McKee.*)

52273. VICIA MACROCARPA Bertol.

"Native to Europe and very closely allied to common vetch (*Vicia sativa*). It has larger seed and heavier seed pods than common vetch, but otherwise differs but little. The climatic and other requirements are the same as for common vetch." (*Roland McKee.*)

For previous introduction, see S. P. I. No. 18813.

52274. VICIA PANNONICA Crantz.

"*Hungarian vetch.* An annual vetch native to Europe and Asia. It makes a less viny growth than common vetch (*Vicia sativa*) or hairy vetch (*V. villosa*), but is a vigorous grower attaining a full stem length of 2½ to 3 feet. It is more winter hardy than common vetch and will seldom winterkill as far north as Washington, D. C. This species is especially adapted to poorly drained areas and is the best of the vetches in this regard." (*Roland McKee.*)

52275. VICIA ATROPURPUREA Desf. **Purple vetch.**

See S. P. I. No. 52269 for description.

52276. VICIA SATIVA L.

"*Common vetch.* An annual, native to Europe, Africa, and Asia. Many varieties have long been in cultivation. Most of these are well adapted to the Pacific Coast States, but only a few are winter hardy in our Southern States. Common vetch is a little less viny than hairy vetch and under favorable conditions attains a height of 3 to 4 feet. It is well adapted for use as green manure, hay, and pasturage." (*Roland McKee.*)

52277. VICIA SATIVA LEUCOSPERMA (Moench) Seringe.

"This subspecies includes the varieties of common vetch with light-colored seeds, many of which are especially adapted in mild climates for late winter or early spring planting. Except in the color of the seed, they are quite like common vetch." (*Roland McKee.*)

52278. VICIA SEPIUM L.

"*Bush vetch.* A perennial species native to Europe and Asia. It is semiupright or bushy in habit. Stock of all kinds relish this species and it affords good pasturage." (*Roland McKee.*)

52279. VICIA SYLVATICA L.

"A perennial species native to Europe, occurring in shaded woody situations. It is relished by stock and makes valuable pasturage." (*Roland McKee.*)

52280. VICIA VILLOSA Roth.

"*Hairy vetch* is an annual native to western Asia, sometimes called sand vetch or Russian vetch, and has been found adapted to nearly all parts of the United States. It produces large crops of excellent hay, but owing to its habit of growth is somewhat difficult to mow. In drought resistance it is perhaps the best of the vetches. It will also stand severe cold, so that it is rarely frozen out even in the northernmost States. This makes it particularly valuable as a winter cover and green-manure crop. Hairy vetch often volunteers and persists, and on this account it is somewhat objectionable where wheat is grown. It is difficult to separate hairy vetch seed from wheat. Seed of hairy vetch weighs 60 pounds to the bushel. A varying proportion of the seed is hard, and this does not germinate for some months. Largely on this account hairy vetch is inclined to persist where once planted. It gives the best results when planted on well-tilled and well-drained land. It may be cured as hay or used green as a soiling crop. For soiling purposes a succession of crops can be maintained by sowing at various

52269 to 52280—Continued.

dates. Where the winters are mild it is possible to use the vetch as green feed all through the autumn and early winter and up to June or later in the summer." (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 34361.

52281 to 52297.

From Seharunpur, Punjab, India. Seeds presented by A. C. Hartless, superintendent, Government Botanic Gardens. Received December 24, 1920.

52281. ACACIA SUMA (Roxb.) Kurz. Mimosaceæ.

A medium-sized tree with white bark and downy branchlets armed with pairs of short-hooked spines. The 20 to 40 pinnæ bear 60 to 100 leaflets; the gum catechu is said to be made from the heartwood of this tree. The bark is peeled off and used for tanning. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 60.*)

52282. ADINA CORDIFOLIA (Roxb.) Benth. and Hook. Rubiaceæ.

A large handsome deciduous tree found in the foothills of the Himalayas from Jumna eastward, ascending to altitudes of 3,000 feet, and extending throughout the moister regions of India, Burma, and Ceylon. It is common in the western peninsula, in the Central Provinces, and all over Burma from Chittagong and Ava to Pegu and Martaban. The leaves are cordate; the yellow flowers are borne in small heads. The wood seasons well, takes a good polish, and is valued for turning, for construction work, furniture, and agricultural implements. (Adapted from *Watt, Dictionary of the Economic products of India, vol. 1, p. 115.*)

52283. ANOGEISSUS LATIFOLIA (Roxb.) Wall. Combretaceæ.

A large handsome tree met with in the sub-Himalayan tract, from the Ravi eastward, ascending to 3,000 feet in central and southern India. It yields a gum which is extensively used in calico printing. The leaves yield a black dye and are very useful in tanning. The gray, hard, shining wood is highly valued on account of its great strength and toughness, but it splits in seasoning and unless kept dry is not very durable. It is used for ax handles, poles for carrying loads, for furniture, agricultural implements, and in shipbuilding. It gives an excellent charcoal. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 257.*)

52284. ANOGEISSUS PENDULA Edgeworth. Combretaceæ.

A small gregarious tree with pendulous branches, found in the arid and northern dry zones of Rajputana-Malwa Plateau, as far as the Nerbudda, in Nimar, and in the Mandla District. The leaves are small, the tree coppices well; the yellowish white wood is hard, but is not in general use. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 258.*)

For previous introduction, see S. P. I. No. 33555.

52285. CELTIS AUSTRALIS L. Ulmaceæ.

A moderate-sized deciduous tree, found in the Suliman and Salt Ranges and throughout the Himalayas from the Indus to Bhutan, ascending to 8,500 feet; also in the Khasi Hills. It is extensively cultivated in southern Europe for fodder; cows fed on the leaves are supposed to give better milk. It is nowhere grown as a fruit tree in India, although the fruit is eaten by all classes and is esteemed. The fruit is remarkably sweet and is supposed to have been the lotus of the ancients, the food of the Lotophagi, which is described as sweet, pleasant, and wholesome and which Homer says was so delicious as to make those who ate it forget their native country. The berries are still eaten in Spain, and the modern Greeks are said to be very fond of them. The gray or yellowish gray wood, with irregular streaks of darker color, is tough and strong and is used for oars, whip handles, and for other purposes requiring toughness and elasticity. The branches are extensively employed in making hayforks, ramrods, and walking sticks. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 2, p. 242.*)

For previous introduction, see S. P. I. No. 48662.

52281 to 52297—Continued.

52286. CRATAEVA RELIGIOSA Forst f. Capparidaceæ.

A moderate-sized, distorted, unarmed tree, with deciduous three-foliolate leaves, found here and there under cultivation from the Ravi eastward to Assam, Manipur, and Burma; also in central and southern India and Bengal; probably wild in Malabar and Kanara. A favorite tree near temples and tombs. The fruit is mixed with mortar to form strong cement, and the rind is used as a mordant in dyeing. The bark of this tree is demulcent, sedative, and alterative tonic, and the fresh leaves and root bark are rubefacient and vesicant. The fruit is said to be sometimes eaten. The yellowish white wood is moderately hard, even grained, and used for drums, models, combs, and in turnery. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 2, p. 583.*)

52287. DIOSPYROS MONTANA Roxb. Diospyraceæ.

A tree, often spinous, found native from the Himalayas (eastward from the Ravi) to Ceylon and Tenasserim. The thin ovate leaves are 2½ inches long. The globose glabrous fruit is one-half inch to 1½ inches in diameter. (Adapted from *Hooker, Flora of British India, vol. 2, p. 555.*)

52288. DIOSPYROS PEREGRINA (Gaertn.) Guerke. Diospyraceæ.

(*D. embryopteris* Pers.)

A dense tree very common in India from the Himalayas (from the Jumna eastward) to Ceylon and Tenasserim and abundant in Bengal. The oblong obtuse leaves are coriaceous. The subglobose fruit, 1 to 2 inches in diameter, is glandular or rusty and usually four to eight seeded. (Adapted from *Hooker, Flora of British India, vol. 2, p. 557.*)

For previous introduction, see S. P. I. No. 33567.

52289. ERYTHRINA VESPERTILIO Benth. Fabaceæ. Coral tree.

A tree, 30 to 40 feet in height, native to Australia, with soft wood used by the aborigines for making shields. It is exceedingly light and spongy and might perhaps be useful for floats for fishing nets. The logs were used by the aborigines for crossing rivers and creeks. (Adapted from *Maiden, Useful Native Plants of Australia, p. 426.*)

For previous introduction, see S. P. I. No. 42466.

52290. FICUS GLOMERATA Roxb. Moraceæ. Fig.

A large tree of the Salt Range and Rajputana found along the sub-Himalayan tracts to Bengal, central and southern India, Assam, and Burma. The bark yields a black dye, and the bark, leaves, and fruit are used in medicine. The fruit is edible but inferior, though greedily eaten by cattle. The leaves are collected as fodder. The soft gray wood is not durable, though it lasts well under water and is used for well frames. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 3, p. 351.*)

For previous introduction, see S. P. I. No. 12111.

52291. HETEROPHRAGMA ADENOPHYLLUM (DC.) Seem. Bignoniaceæ.

A tree, 30 to 50 feet high, native to Assam and eastern Bengal and extending to Tenasserim and the Andamans. The pinnate leaves are 1 to 1½ feet long and the subsessile, acute, or obtuse leaflets are 7 to 14 inches long and 5 inches wide. The stout, many-flowered, terminal panicles bear tomentose, tubular-ventricose flowers, rose or yellow, 2 inches in diameter, and hardly crisped or crenate. The cylindric spiral capsule is 1 to 3 feet long and 1 inch in diameter. (Adapted from *Hooker, Flora of British India, vol. 4, p. 381.*)

52292. KYDIA CALYCINA Roxb. Malvaceæ.

A tree native to the tropical regions of the Himalayas, from Kumaon eastward, and throughout the Western Ghats, with rounded cordate leaves, 4 to 5 inches long and 3 inches wide, glabrous above or with thinly scattered hairs, closely felted beneath. The much-branched, many-flowered inflorescence bears white or pink flowers. (Adapted from *Hooker, Flora of British India, vol. 1, p. 348.*)

For previous introduction, see S. P. I. No. 47702.

52281 to 52297—Continued.

52293. MORINGA OLEIFERA Lam. Moringaceæ. **Horse-radish tree.**
(*M. pterygosperma* Gaertn.)

"A small tree, cultivated as an ornamental in Cuba, usually 15 to 20 feet in height, erect, with compound leaves nearly a foot long. The white flowers are borne in panicles, and the slender pods are often a foot long." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 46386.

52294. OWENIA CERASIFERA F. Muell. Meliaceæ.

A small tree, native to Queensland, with pinnate leaves consisting of 6 to 10 obliquely oval-oblong, obtuse leaflets, 1½ to 3 inches long, glabrous above, pubescent underneath. The black drupes are globular, 1½ inches in diameter, with red flesh. (Adapted from *Bentham, Flora Australiensis, vol. 1, p. 386.*)

For previous introduction, see S. P. I. No. 32819.

52295. PHYLLANTHUS EMBLICA L. Euphorbiaceæ. **Nelli.**

A moderate-sized deciduous tree native to the forests of tropical India and Burma. It yields a gum which is little known. The fruit, known as the emblic myrobalan, is used as a medicine and also in dyeing and tanning. As the fruit ripens the tannic acid diminishes and the fruit becomes edible and even pleasant to eat. It is the size of a small gooseberry, with a fleshy outer covering and a hard three-celled nut containing six seeds. The fruit is used for preserves and is also prepared as a pickle. A sherbet made from the fruit is a favorite cooling drink. The leaves and bark are used for tanning; the leaves also make good fodder. The red, hard close-grained wood when well seasoned is flexible, tough, and tolerably straight grained. It is used for building purposes, furniture, agricultural implements, gunstocks, and is adapted for turning. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 6, pt. 1, p. 217.*)

For previous introduction, see S. P. I. No. 47751.

52296. PUTRANJIVA ROXBURGHII Wall. Euphorbiaceæ.

A moderate-sized evergreen tree, native to tropical India, where it occurs wild and cultivated from the lower Himalayas, in Kumaon, eastward and southward to Pegu and Ceylon. The obtuse, acute leaves are 2 to 3 inches long. The globose white-tomentose fruits are the size of a cherry. (Adapted from *Hooker, Flora of British India, vol. 5, p. 336.*)

For previous introduction, see S. P. I. No. 33581.

52297. WRIGHTIA TOMENTOSA Roem. and Schult. Apocynaceæ.

A small, usually crooked, deciduous tree with corky bark, native to tropical India, extending from the Indus eastward and southward to Ceylon, Burma, and Penang, ascending to 2,000 feet in the Himalayas. The densely tomentose, elliptic leaves are 3 to 6 inches long and 1½ to 2½ inches wide. The yellowish flowers, with orange coronal scales, occur in many-flowered cymes. (Adapted from *Hooker, Flora of British India, vol. 3, p. 653.*)

Received as *Wrightia mollissima*, which is now generally referred to *W. tomentosa*.

52298 to 52304.

From Cali, Valle del Caucà, Colombia. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received December 27, 1920. Quoted notes by Mr. Popenoe.

52298. ANANAS SATIVUS Schult. f. Bromeliaceæ. **Pineapple.**

"(No. 530. December 3, 1920.) Shoots of *Cambrai* pineapple. From the Hacienda Manuelita, near Palmira. This is an excellent pineapple, by far the best variety I have seen in Colombia, but apparently of very limited distribution. It is fairly common in the Cauca Valley, but is not grown on an extensive commercial scale.

"The fruit is oblong to oblong-conic, commonly tapering slightly toward the apex. It weighs 4 to 8 pounds and would probably attain even larger

52298 to 52304—Continued.

size under good cultivation. The surface is fairly smooth, the eyes being only slightly deeper than those of Smooth Cayenne. The flesh is pale yellow, exceedingly juicy, of rich, subacid flavor, and quite tender. While it does not equal Smooth Cayenne in sweetness and delicacy of flavor, it is a much better fruit. The plant is a large and vigorous grower with serrate leaves."

52299. CARICA sp. Papayaceæ.

"(No. 523a. November 22, 1920.) Seeds of *red-fruited papayuela*. From a garden near Armenia, Depto. de Caldas, at an altitude of about 5,000 feet. This is the most interesting form of Carica which I have discovered in Colombia. It is remarkable for the rich crimson color of its fruits. Whether or not this color will be inherited by its seedlings I do not know; if it is, then we have in this form a papaya of much interest for use in breeding. The stem and petioles of the plant are deep purple. The fruits are oblong-elliptic, about 4 inches long, and as they mature they assume a crimson color which is at length deep and rich and very attractive. The flesh is white, like the normal form of the species, rather acid, with an applelike scent. A cross between this species and *Carica papaya* might produce a new fruit of most attractive appearance."

52300. PASSIFLORA MALIFORMIS L. Passifloraceæ. Granadilla.

"(No. 531a. December 3, 1920.) Seeds of *granadilla*, from the Cali market. This is a species which I have not seen elsewhere in Colombia. The fruit is remarkable for its unusually hard shell. Except for this character and its pale-green color, it greatly resembles the fruit of *Passiflora edulis*. It is a better fruit than some of the other species of Passiflora found in Colombia."

For previous introduction, see S. P. I. No. 43330.

52301. RHEEDIA MADRUNO (H. B. K.) Planch. and Triana. Clusiaceæ.

"(No. 528. December 3, 1920.) Seeds of *madroño*. From the Hacienda Manuelita, near Palmira. This is a common tree, both wild and cultivated, in the Cauca Valley and a favorite fruit. It occurs at altitudes of 3,000 or 4,000 feet and probably will not, therefore, be sufficiently frost resistant for cultivation in California. It may succeed in southern Florida, and will, of course, be adapted to tropical regions, such as the West Indies.

"The tree, which reaches about 35 feet in height, is a handsome one. It is commonly pyramidal, sometimes rather slender, and its abundant foliage is dark green. The leaves are elliptic and about 6 inches long. The fruits are the size of a small lemon, and about the same color. The skin is thick and leathery and very rough; the flesh is whitish, translucent, and of an aromatic subacid taste which is very agreeable. The two or three rather large seeds are oblong.

"Compared with the more important tropical fruits, such as the mango, the *madroño* can not be considered of great value; yet the ornamental appearance of the tree and the pleasant flavor of the fruit make it well worth growing in tropical gardens."

52302. RUBUS GLAUCUS Benth. Rosaceæ.

"(No. 522a. November 22, 1920.) Seeds collected near the Hacienda Cajamarca, on the Quindio trail between Ibague and Armenia, at an altitude of about 8,000 feet. [This plant has been described under S. P. I. No. 50691.] It is a common species in Central America and northwestern South America, sometimes cultivated for its fruit, which is an excellent berry. Where not cultivated, the fruit produced by wild plants is very commonly gathered and sold in the markets of towns and cities.

"These seeds were taken from an unusually productive plant. Since scanty productiveness is the principal defect of this species, viewed from a horticultural standpoint, an effort to obtain strains more productive than the average seems well worth while. In addition to being a productive plant, this number can be recommended as producing fruits of excellent quality."

52298 to 52304—Continued.

52303. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

"(No. 529. December 3, 1920.) Tubers of *papa criolla* (native potato) from the Cali market. This is the common yellow-fleshed potato of the Andes, a variety of small size but remarkably rich flavor. The variety is said to be very early and to be suited to cultivation in a warmer climate than others. It is a round potato, here not commonly over 3 inches in diameter, deep rose-colored, with very deep eyes, a very thin skin which peels readily from the boiled tuber, and mealy flesh of rich yellow color and excellent quality. This appears to be a very interesting variety for trial in the United States."

For previous introduction, see S. P. I. No. 52316.

52304. (Undetermined.)

"(No. 527a. December 3, 1920.) From La Manuelita, near Palmira, Colombia. Seeds of *carbonero*, a mimosaceous tree, 60 feet high, cultivated in the Cauca Valley as a shade tree in coffee plantations. The tree, said to be an exceedingly rapid grower and to furnish timber of good quality, is rather attractive in appearance, with finely pinnate foliage and small whitish flowers. It seems to me worthy of trial in southern Florida as a quick-growing shade tree for planting along streets and avenues."

52305. MALUS SYLVESTRIS Mill. Malaceæ. **Apple.**
(*Pyrus malus* L.)

From Rangiora, New Zealand. Cuttings presented by Ivory's Nurseries. Received October 19, 1920.

"*Double Vigor*. This has been raised after many years of selection and with us is blight proof and much more vigorous in growth than the Northern Spy stocks which are generally used in this Dominion." (*N. Goldsbury*, of Ivory's Nurseries.)

INDEX OF COMMON AND SCIENTIFIC NAMES.

Abutilon spp., 51483, 51898, 51899.
Acacia spp., 51428, 51484, 51485, 51627, 51808.
arabica. See *A. scorpioides*.
scorpioides, 51900.
suma, 52281.
Acom, *Dioscorea latifolia*, 51426.
Aconitum ferox, 51744.
fischeri, 51745.
septentrionale, 51746.
variegatum, 51747.
Acrocomia sclerocarpa, 51742.
Adenanthera pavonina, 51809.
Adina cordifolia, 52282.
Adonis vernalis, 51762.
Aeschymomene telekii, 51486.
Agathis loranthifolia. See *Dammara alba*.
Albizzia lebbeck, 51901, 51902.
Allium sativum, 51363.
Amaranth, *Amaranthus caudatus*, 51487.
Amaranthus caudatus, 51487.
Amomum spp., 51628, 51629.
Amygdalus communis × *persica*, 51705.
persica, 51794.
Anacardium occidentale, 51699.
Ananas sativus, 51377, 51378, 52298.
Andropogon bombycinus, 51792.
insculptus, 51630.
Androsace coccinea, 51748.
Annatto tree, *Bixa orellana*, 51910.
Annona diversifolia, 51404.
muricata, 51374.
senegalensis, 51903.
Anogeissus latifolia, 52283.
leiocarpa, 51904.
pendula, 52284.
Apple. See *Malus* spp.
crab, *Malus floribunda*, 51873.
Siberian, *Malus baccata*, 51872.
wild, *Malus glaucescens*, 51752.
Arachis hypogaea, 51905–51907.
Aralia cachemirica, 51366.
Areca catechu, 51803.
Aristida sp., 51908.
Aronia arbutifolia, 51740.
Arrayan, *Eugenia* sp., 51562.
Artocarpus champeden, 51804.
polyphema. See *A. champeden*.
Asclepias curassavica, 51368.
Asimina triloba, 51703.
Asparagus falcatus, 51909.
Avena nuda, 51894.
sativa, 51382–51386.
sterilis, 51631.
Bamboo, *Bambos balcooa*, 51361.
Phyllostachys pubescens, 51476–51478.
Bambos balcooa, 51361.
Banana, *Musa ensete*, 51518.
Barberry. See *Berberis* spp.
Barley, *Hordeum vulgare pallidum*, 52167.
naked, *Hordeum distichon nudum*, 51415.
Baryxylum inerme, 51810.
Bean, common, *Phaseolus vulgaris*, 51449, 51450, 51528, 51649, 51701, 52186–52209.
goa, *Botor tetragonoloba*, 51765.
hyacinth, *Dolichos lablab*, 51433, 51497, 51608, 51938.
jack, *Canavali ensiforme*, 51607.
mung, *Phaseolus aureus*, 52184, 52185.
yam, *Cacara erosa*, 51364.
Befaria phillyreaefolia, 51786.
Bentinckia nicobarica, 51707.
Berberis quinduensis, 51795.
rigidifolia, 51787.
Berry, Colombian, *Rubus macrocarpus*, 51401, 51706, 51764.
Bixa orellana, 51910.
Blackberry, *Rubus*, spp., 51402, 51535, 51569.
mora de piedra, *Rubus bogotensis*, 51569.
Rubus sp., 51535.
Blumea balsamifera. See *Placus balsamifer*.
Botor tetragonoloba, 51765.
Brachystegia sp., 51911.
Browne a grandiceps, 51796.
Butia capitata pulposa, 51890.
Butyrospermum parkii, 51912.
Byrsonima spicata, 51405.

Cabritos, undetermined, 51412.
Cacara erosa, 51364.
Cactus, *Cereus hexagonus*, 51556.
Epiphyllum sp., 51561.
oxypetalum, 51559.
phyllanthoides, 51560.
Hylocereus sp., 51763.
undatus, 51565.
Caimito, *Chrysophyllum cainito*, 51814.
Cajan indicum, 51913, 51914.
Calamus scipionum, 51708.
Callistemon citrina, 51503.
Callitris cupressiformis, 51753, 51754.
Calotropis procera, 51429.

Canangium odoratum, 51811.
Canarium sp., 51766.
commune. See *C. indicum*.
indicum, 51812.
luzonicum, 51425.
rufum, 51805.
Canavali ensiforme, 51607.
Candollea graminifolia, 51755.
Canelo, *Drimys winteri*, 51797.
Canjuriol, undetermined, 51413.
Capparis sp., 51572.
Capsicum annuum, 51396, 51660–51667.
Capulin, *Prunus serotina*, 51393.
Carapa guianensis, 51767.
Carbonero, undetermined, 52304.
Cardiospermum spp., 51915, 51916.
Carica sp., 52299.
candamarcensis, 51389.
papaya, 51367.
Caryota mitis, 51709.
rumphiana, 51710.
Cashew, *Anacardium occidentale*, 51699.
Cassava, *Manihot esculenta*, 51358–51360.
Cassia spp., 51917–51919.
didymobotrya, 51632.
occidentalis, 51573.
siamea, 51813.
Castor-bean, *Ricinus communis*, 51375, 51376, 51453, 51454, 51532–51534, 51651, 52212, 52213.
Catjang, *Vigna cylindrica*, 52229.
Cedrela sinensis. See *Toona sinensis*.
Celtis australis, 52285.
Cenchrus sp., 51488.
Cereus hexagonus, 51556.
Cerezo, *Ziziphus* sp., 51408.
Chamaedorea sp., 51424.
Chaparron, undetermined, 51411.
Chayota edulis, 51421, 51422, 51704.
Chayote. See *Chayota edulis*.
Chicken corn, *Holcus sorghum drummondii*, 52051.
Chick-pea, *Cicer arietinum*, 51922.
Chloris abyssinica, 51920, 51921.
Chrysalidocarpus lucubensis, 51711.
Chrysophyllum cainito, 51814.
Cicer arietinum, 51922.
Citrullus vulgaris, 51430, 51923.
Citrus nobilis deliciosa, 51886.
sinensis, 51887.
Clavel del monte, *Lasianthus* sp., 51801.
Clitoria ternatea, 51529, 51924.
Clover, *Trifolium* spp., 51543, 51545.
bur, *Medicago hispida denticulata*, 51583.
Cocos pulposa. See *Butia capitata pulposa*.
Coffea spp., 51431, 51490.
arabica, 51480, 51828, 51829.
laurentii, 51481.
liberica, 51482.
robusta. See *C. laurentii*.
Coffee, *Coffea* spp.:
Blue Mountain, *Coffea* sp., 51490.
Nandi, *Coffea* sp., 51431.
Sanani, *Coffea arabica*, 51829.
Yaffei, *Coffea arabica*, 51828.
Cok-see, *Rhynchospora* sp., 51785.
Colcus rotundifolius, 51768.
tuberosus. See *C. rotundifolius*.
Colocasia esculenta, 51387, 51419, 51896.
Combretum sp., 51491.
Coral-bean tree, *Adenanthera pavonina*, 51809.
Coral tree, *Erythrina vespertilio*, 52289.
Cordia holstii, 51551.
Coriander, *Coriandrum sativum*, 51492.
Coriandrum sativum, 51492.
Corn, *Zea mays*, 51458–51460, 51778, 52238–52254.
Corylus colurna, 51779, 51780.
Cosmos, *Cosmos sulphureus*, 51925.
Cosmos sulphureus, 51925.
Cotoneaster microphylla, 51843.
simonsi, 51493.
Cotton, *Gossypium* spp., 51505, 51950.
Gossypium hirsutum, 51944, 51945.
nanking soudanensis, 51946–51949.
kidney, *Gossypium* sp., 51504.
Cowpea, *Vigna sinensis*, 52230–52232.
Crabwood tree, *Carapa guianensis*, 51767.
Crataeva religiosa, 52286.
Crotalaria spp., 51494, 51495, 51574, 51633, 51634, 51926–51930.
alata, 51832.
grantiana, 51833.
incana, 51834.
laburnifolia, 51835.
polysperma, 51836.
retusa, 51837, 51842.
saltiana, 51838.
spectabilis, 51839.
striata, 51840.
usaramoensis, 51841.
Cucumber, *Cucumis metuliferus*, 51931, 51932.
Cucumis sativus, 51933, 51934.
Cucumis spp., 51575, 51935–51937.
melo, 51893.
metuliferus, 51931, 51932.
sativus, 51933, 51934.
Custard-apple, *Annona senegalensis*, 51903.
Cyamopsis psoraloides. See *C. tetragonoloba*.
tetragonoloba, 51371–51373, 51598–51601, 51696.
Cyclanthera pedata, 51390, 51557.
Cyrtostachys lakka, 51870.

Dactyloctenium aegyptium, 51496.
Daemonorops fissus. See *Calamus scipionum*.
trichrous, 51712.

Dammara alba, 51713, 51815.
Dasheen, *Colocasia esculenta*, 51896.
Datura metel fastuosa, 51602, 51603.
Deguelia microphylla, 51816.
Desfontainea splendens, 51395.
Dialium laurinum, 51770.
Dicentra chrysantha, 51613.
Digitaria abyssinica, 51432.
nodosa, 51635.
Dioscorea latifolia, 51426.
Diospyros embryopteris. See *D. peregrina*.
montana, 52287.
peregrina, 52288.
Dissotis eximia, 51463.
Dolichos lablab, 51433, 51497, 51608, 51938.
Drimys winteri, 51797.
Drymophloeus spp., 51716, 51717.
ambiguus, 51714.
propinquus, 51715.
Duchesnea sp., 51844.
Duranta repens, 51558, 51939.
Durian, *Durio zibethinus*, 51464.
Durio zibethinus, 51464.

Echinochloa pyramidalis, 51940, 51941.
Eggplant, *Solanum melongena*, 52222.
Ehretia acuminata, 51891.
Elaeis guineensis, 51718.
Elaeocarpus angustifolius, 51817.
Eleusine aegyptiaca. See *Dactyloctenium aegyptium*.
coracana, 51498, 51942, 51943.
Elichrysum sp., 51434.
Enterolobium cyclocarpum, 51406.
Epiphyllum sp., 51561.
oxypetalum, 51559.
phyllanthoides, 51560.
Eragrostis sp., 51636.
abyssinica, 51499.
schimperi. See *Harpachne schimperi*.
superba, 51500, 51501.
Erigeron sp., 51502.
Erlangea marginata, 51554.
Erythrina sp., 51637.
vespertilio, 52289.
Eucalyptus alpina, 51756.
Eugenia spp., 51562, 51625.
edulis. See *Myrciaria edulis*.
Eupatorium sp., 51369.
Eusideroxylon zwageri, 51818.
Euterpe acuminata, 51719.

Ficus carica, 51751.
glomerata, 52290.
Fig. See *Ficus* spp.
Flacourtia rukam, 51772.
Flax, *Linum usitatissimum*, 51443, 51515.
Fragaria chiloensis, 51563.
nilgerrensis, 51616.
vesca, 51564.

Garcinia mangostana, 51465, 51831.
Garlic, *Allium sativum*, 51363.
Gaultheria pubiflora, 51570.
Gentian. See *Gentiana* sp.
Gentiana sp., 51749.
Gladiolus sp., 51435.
Gossypium spp., 51504, 51505, 51950.
hirsutum, 51944, 51945.
nanking soudanensis, 51946–51949.
Granadilla, *Passiflora maliformis*, 52300.
sweet, *Passiflora ligularis*, 51398.
Grass, *Andropogon bombycinus*, 51792.
Andropogon insculptus, 51630.
Aristida sp., 51908.
Cenchrus sp., 51488.
Chloris abyssinica, 51920, 51921.
Dactyloctenium aegyptium, 51496.
Digitaria abyssinica, 51432.
nodosa, 51635.
Echinochloa pyramidalis, 51940, 51941.
Eragrostis sp. 51636.
superba, 51500, 51501.
Harpachne schimperi, 51594.
Kamerun, *Holcus sorghum effusus*, 52052–52087.
Leptochloa spp., 51514, 52171.
Manisuris exaltata, 52174.
Natal, *Tricholaena rosea*, 51597.
Panicum spp., 52178, 52179.
geminatum, 51525.
glutinosum, 51781.
laxum, 51782.
quadrifarium, 51446.
Pappophorum abyssinicum, 51645.
Paspalum dilatatum, 51646.
humboldtianum, 51783.
Pennisetum spp., 51526, 51527, 51647, 52183.
ciliare, 51648.
durum, 51784.
purpureum, 52182.
schimperi, 51584.
Pollinia articulata, 51793.
Saccharum spontaneum, 52215.
Sporobolus sp., 51652.
fimbriatus, 52223.
indicus, 52224.
tabucki, *Holcus sorghum verticilliflorus*, 52119–52166.
Tunis, *Holcus sorghum exiguus*, 52088–52118.
Guaiacum guatemalense, 51407.
Guanacaste, *Enterolobium cyclocarpum*, 51406.
Guar, *Cyamopsis tetragonoloba*, 51371–51373, 51598–51601, 51696.
Guayabo pesjua, *Myrciaria* sp., 51626.
Guayule, *Parthenium argentatum*, 51700.
Guizotia abyssinica, 51638.
Gynandropsis pentaphylla, 51489.
Gynocardia odorata, 51668.

Hardenbergia monophylla. See *Kennedya monophylla.*
Harpachne schimperi, 51594.
Hazel, Turkish, *Corylus colurna*, 51779, 51780.
Hedyotis sp., 52263.
Hedysarum coronarium, 51888, 51889.
Heterophragma adenophyllum, 52291.
Hibiscus spp., 51436–51438, 51506–51508, 51576.
Holcus sorghum, 51439, 51509, 51577–51581, 51609–51611, 51618–51622, 51952–52050.
sorghum drummondii, 52051.
effusus, 52052–52087.
exiguus, 52088–52118.
verticilliflorus, 52119–52166.
Hordeum distichon nudum, 51415.
vulgare pallidum, 52167.
Horse-radish tree, *Moringa oleifera*, 52176, 52293.
Hydnocarpus anthelminthica, 51773.
wightiana, 51362.
Hylocereus sp., 51763.
undatus, 51565.
Hyphaene thebaica, 51440.

Ilama, *Annona diversifolia*, 51404.
Ilang-ilang. See Ylang-ylang.
Ilex sp., 51788.
Impatiens sp., 51510.
Indigofera sp., 51511.
Inula sp., 51441.
Ipomoea spp., 51512, 51639, 52168, 52169.
calycina. See *I. hardwickii.*
hardwickii, 51513.
Iris sp., 51845.

Jaboncillo, *Sapindus saponaria*, 51410.
Jaboticaba, *Myrciaria cauliflora*, 51830.
Jagera speciosa, 51806.
Juniper, *Juniperus procera*, 51442.
Juniperus procera, 51442.

Kanari, *Canarium indicum*, 51812.
Karroo, *Pentzia incana*, 51658.
Katinga, *Merrilla caloxylon*, 51775.
Kennedia monophylla, 51757, 51758.
Kigelia pinnata, 52170.
Kihellahella, *Trichilia* sp., 52225.
Kydia calycina, 52292.

Langsat, *Lansium domesticum*, 51769.
Lansium domesticum, 51769.
Lasianthus sp., 51801.
Latania commersonii, 51720.
loddigesii, 51721.
verschaffeltii, 51722.
Lavatera assurgentiflora, 51391.
Lebbeck tree, *Albizzia lebbeck*, 51901, 51902.
Leonotis sp., 51582.
Leptochloa spp., 51514, 52171.
Leucadendron argenteum. See *Protea argentea.*
Llano, undetermined, 51461.
Licuala rumphii, 51723.
Linum usitatissimum, 51443, 51515.
Litchi chinensis, 51466–51472.
Lotus sp., 51869.
angustissimus, 51856.
gracilis, 51857.
arabicus, 51858.
conimbricensis, 51859.
cytisoides, 51860.
edulis, 51861.
filicaulis, 51862.
gebelia, 51863.
jacobaeus, 51864.
lamprocarpus, 51865.
ornithopodioides, 51866.
suaveolens, 51867.
tenuis, 51868.
Lupine. See *Lupinus* spp.
Lupinus sp., 51516.
cruckshanksii, 51566, 51798.
termis, 52172.
Lychee. See *Litchi chinensis.*
Lycopersicon esculentum, 52173.

Mahaleb, undetermined, 52267.
Malus baccata, 51872.
floribunda, 51873.
glaucescens, 51752.
niedzwetzkyana, 51874.
prunifolia, 51875.
sylvestris, 52305.
Malvisco, *Lavatera assurgentiflora*, 51391.
Mangifera indica, 51605, 51759–51761, 51771.
odorata, 51774.
Mango. See *Mangifera indica.*
Mangosteen, *Garcinia mangostana*, 51465, 51831.
Manihot esculenta, 51358–51360.
utilissima. See *M. esculenta.*
Manisuris exaltata, 52174.
Maret, undetermined, 51462.
Martinezia caryotaefolia. See *Tilmia caryotaefolia.*
crosa, 51724.
Meconopsis pseudointegrifolia, 51750.
Medicago hispida denticulata, 51583.
Melhania ferruginea, 51951.
Melothria spp., 51517, 51595.
Merrillia caloxylon, 51775.
Milkweed, *Asclepias curassavica*, 51368.
Millet, pearl, *Pennisetum glaucum*, 51447, 51448, 52181.
ragi, *Eleusine coracana*, 51498, 51942, 51943.
Millettia atropurpurea, 51871.
Mimosa glomerata, 51370.
Mimusops elengi, 51819.
kauki, 51820.
Momordica sp., 52175.
schimperiana, 51641.
trifoliolata, 51640.
Monnina parviflora, 51571.
Moringa oleifera, 52176, 52293.
pterygosperma. See *M. oleifera.*

Morning-glory, *Ipomoea* spp., 51512, 51513, 51639, 52168, 52169.
Murraya caloxylon. See *Merrillia caloxylon.*
Musa ensete, 51518.
Muskmelon, *Cucumis melo*, 51893.
Mutisia clematis, 51789.
Myrah, undetermined, 51547.
Myrciaria sp., 51626.
cauliflora, 51830.
edulis, 51614.

Nance, *Byrsonima spicata*, 51405.
Naranjilla, *Solanum quitoense*, 51394.
Nelli, *Phyllanthus emblica*, 52295.
Nenga schefferiana, 51725.
Nephelium sp., 51474.
lappaceum, 51473.
litchi. See *Litchi chinensis.*
Nicotiana tabacum, 52177.

Oats, *Avena sativa*, 51382–51386.
Avena sterilis, 51631.
naked, *Avena nuda*, 51894.
Ocimum suave, 51587.
Oenocarpus utilis. See *Euterpe acuminata.*
Olea chrysophylla, 51519.
Oncosperma filamentosum, 51726.
horridum, 51776.
tigillaria, 51777.
Orange, *Citrus sinensis*, 51887.
mandarin, *Citrus nobilis deliciosa*, 51886.
Oryza sativa, 51444, 51445, 51475, 51520–51524, 51642–51644.
Owenia cerasifera, 52294.
Oxalis tuberosa, 51397.

Pacaya, *Chamaedorea* sp., 51424.
Pachyrhizus angulatus. See *Cacara erosa.*
Padouk, *Pterocarpus indicus*, 51821.
Palm, *Bentinckia nicobarica*, 51707.
betel-nut, 51803.
Butia capitata pulposa, 51890.
Caryota mitis, 51709.
rumphiana, 51710.
Chrysalidocarpus lucubensis, 51711.
Cyrtostachys lakka, 51870.
Daemonorops trichrous, 51712.
doum, *Hyphaene thebaica*, 51440.
Drymophloeus spp., 51716, 51717.
ambiguus, 51714.
propinquus, 51715.
edible, *Salakka* sp., 51479.
Euterpe acuminata, 51719.
Latania commersonii, 51720.
loddigesii, 51721.
verschaffeltii, 51722.
Licuala rumphii, 51723.
Macauba, *Acrocomia sclerocarpa*, 51742.
Palm, *Martinezia erosia*, 51724.
Nenga schefferiana, 51725.
oil, *Elaeis guineensis*, 51718.
Oncosperma filamentosum, 51726.
horridum, 51776.
tigillaria, 51777.
Phoenix reclinata, 51451, 51733, 51734, 52210.
Pinanga kuhlii, 51735.
Ptychandra glauca, 51736.
rattan, *Calamus scipionum*, 51708.
Rhopaloblaste hexandra, 51737.
Seaforthia elegans, 51738.
Tilmia caryotaefolia, 51739.
Pandanus atrocarpus, 51727.
furcatus, 51728.
labyrinthicus, 51729.
polycephalus, 51730.
tectorius, 51731.
vandermeeschii, 51732.
Panicum, spp., 52178, 52179.
geminatum, 51525.
glutinosum, 51781.
laxum, 51782.
pyramidale. See *Echinochloa pyramidalis.*
quadrifarium, 51446.
Papa cariba, *Dioscorea* sp., 51426.
criolla, *Solanum tuberosum*, 52303.
Papaw, *Asimina triloba*, 51703.
Papaya, *Carica papaya*, 51367.
Papayuela, red-fruited, *Carica* sp., 52299.
Pappophorum abyssinicum, 51645.
Parkinsonia aculeata, 52180.
Parthenium argentatum, 51700.
Paspalum dilatatum, 51646.
humboldtianum, 51783.
Passiflora ligularis, 51398.
maliformis, 52300.
Paulownia fortunei, 52268.
Pea, garden, *Pisum sativum*, 51427, 51452.
Peach, *Amygdalus persica*, 51794.
Peach-almond hybrid, *Amygdalus communis* × *persica*, 51705.
Peanut, *Arachis hypogaea*, 51905–51907.
Pear. See *Pyrus* spp.
willow-leaved, *Pyrus salicifolia*, 51885.
Peltophorum ferrugineum. See *Baryxylum inerme.*
Pennisetum spp., 51526, 51527, 51647, 52183.
ciliare, 51648.
durum, 51784.
glaucum, 51447, 51448, 52181.
purpureum, 52182.
schimperi, 51584.
typhoideum. See *P. glaucum.*
Pentas zanzibarica, 51553.
Pentzia incana, 51658.

Pepper, *Capsicum annuum*, 51396.
red, *Capsicum annuum*, 51660–51667.
Phaseolus sp., 51650.
aureus, 52184, 52185.
vulgaris, 51449, 51450, 51528, 51649, 51701, 52186–52209.
Phleum pratense, 51379, 51423, 51624, 51669–51676, 51895.
Phoenix reclinata, 51451, 51733, 51734, 52210.
Phyllanthus emblica, 52295.
Phyllocarpus septentrionalis, 51409.
Phyllostachys mitis. See *P. pubescens*.
pubescens, 51476–51478.
Physalis peruviana, 51400, 51530.
Pigeon-pea, *Cajan indicum*, 51913, 51914.
Pinanga kuhlii, 51735.
Pineapple, *Ananas sativus*, 51377, 51378, 52298.
Pistacia lentiscus, 51698.
Pisum sativum, 51427, 51452.
Pitahaya blanca, *Hylocereus* sp., 51763.
Pithecolobium saman. See *Samanea saman*.
Placus balsamifer, 51659.
Plum, *Prunus americana lanata*, 51878.
Prunus bokhariensis, 51743.
mexicana, 51880.
munsoniana, 51881.
reverchonii, 51882.
Wildgoose, *Prunus hortulana*, 51879.
Poha, *Physalis peruviana*, 51400, 51530.
Polakowskia tacaco, 51606.
Pollinia articulata, 51793.
Poplar. See *Populus* spp.
Populus adenopoda, 51876.
charkowiensis, 51381.
maximowiczii, 51877.
Potato, *Solanum tuberosum*, 51416, 51417, 52303.
wild, *Solanum* sp., 51697.
Protea argentea, 51623.
Prunus americana lanata, 51878.
bokhariensis, 51743.
hortulana, 51879.
mexicana, 51880.
munsoniana, 51881.
persica. See *Amygdalus persica*.
reverchonii, 51882.
serotina, 51393.
Psophocarpus tetragonolobus. See *Botor tetragonoloba*.
Pterocarpus indicus, 51821.
Pterygota alata, 51822.
Ptychandra glauca, 51736.
Putranjiva roxburghii, 52296.
Pyrus sp., 51380.
arbutifolia. See *Aronia arbutifolia*.
baccata. See *Malus baccata*.
betulaefolia, 51883.
floribunda. See *Malus floribunda*.
Pyrus glaucescens. See *Malus glaucescens*.
malifolia, 51702.
malus. See *Malus sylvestris*.
niedzwetzkyana. See *Malus niedzwetzkyana*.
nivalis, 51884.
prunifolia. See *Malus prunifolia*.
salicifolia, 51885.

Rambutan, *Nephelium lappaceum*, 51473.
Raspberry, *Rubus* spp., 51536, 52214.
Rhamphicarpa fistulosa, 52211.
Rheedia madruno, 52301.
Rhopaloblaste hexandra, 51737.
Rhus sp., 51531.
Rhynchospora sp., 51785.
Ribes longeracemosum, 51617.
Rice, *Oryza sativa*, 51444, 51445, 51475, 51520–51524, 51642–51644.
Ricinus communis, 51375, 51376, 51453, 51454, 51532–51534, 51651, 52212, 52213.
Rosa spp., 51846–51849.
Rose, *Rosa* spp., 51846–51849.
Rottboellia exaltata. See *Manisuris exaltata*.
Rubus spp., 51402, 51535, 51536, 51850, 51851, 52214.
bogotensis, 51569.
glaucus, 52302.
macrocarpus, 51401, 51706, 51764.
macrophyllus, 51615.
Rye, *Secale cereale*, 51677–51682.
Buhlendorfer, 51680.
(Denmark), 51679.
Klooster, 51681.
Krüger, 51678.
Petkusser, 51682.

Petkusser × Krüger, 51677.
Saccharum officinarum, 51589–51593.
spontaneum, 52215.
Salakka sp., 51479.
Samanea saman, 51455.
Sapindus saponaria, 51410.
Sapium sebiferum. See *Stillingia sebifera*.
Saussurea lappa, 51852.
Schotia latifolia, 51892.
Sclerocarya caffra, 52216.
Screw pine. See *Pandanus* spp.
Seaforthia elegans, 51738.
Secale cereale, 51677–51682.
Sechium edule. See *Chayota edulis*.
Sedge, *Rhynchospora* sp., 51785.
Senat, *Cucumis* sp., 51937.
Senecio spp., 51537, 51585.
Service tree, *Sorbus domestica*, 51420.
Sesame. See *Sesamum orientale*.
Sesamum orientale, 51456, 51538, 52217–52219.
Sesban sp., 51539.
Sida sp., 51540.

Siete-cueros, *Tibouchina* sp., 51799.
Solanum sp., 51697.
bullatum, 51802.
melongena, 52222.
naumanni, 52220, 52221.
quitoense, 51394.
tuberosum, 51416, 51417, 52303.
wrightii, 51541.
Sorbus domestica, 51420.
Sorghum vulgare. See *Holcus sorghum*.
Sorghum, *Holcus sorghum*, 51439, 51509, 51577–51581, 51609–51611, 51618–51622, 51952–52050.
Holcus sorghum drummondii, 52051.
sorghum effusus, 52052–52087.
exiguus, 52088–52118.
verticilliflorus, 52119–52166.
Soursop, *Annona muricata*, 51374.
Sphenostylis stenocarpa, 51365.
Sporobolus sp., 51652.
fimbriatus 52223.
indicus, 52224.
Sterculia alata. See *Pterygota alata*.
Stillingia sebifera, 51897.
Stizolobium niveum, 51612.
Strawberry, *Fragaria chiloensis*, 51563.
Fragaria nilgerrensis, 51616.
vesca, 51564.
Stylidium graminifolium. See *Candollea graminifolia*.
Styrax benzoin, 51807.
Sugar cane, *Saccharum officinarum*:
Badila, 51589.
Goru, 51593.
H. Q. 426, 51590.
7 R. 428, 51592.
1900 seedling, 51591.
Sula, *Capparis* sp., 51572.
Sulla, *Hedysarum coronarium*, 51888, 51889.

Tacsonia sp., 51392.
manicata, 51567.
mollissima, 51399.
pinnatistipula, 51568.
Taro, *Colocasia esculenta*, 51387, 51419.
Tecoma stans, 51586.
yellow, *Tecoma stans*, 51586.
Teff, *Eragrostis abyssinica*, 51499.
Telfairia pedata, 51542.
Thunbergia sp., 51596.
Tibouchina sp., 51799.
Tilmia caryotaefolia, 51739.
Timothy, *Phleum pratense*, 51379, 51423, 51624, 51669–51676, 51895.
Tobacco, *Nicotiana tabacum*, 52177.
Tomato, *Lycopersicon esculentum*, 52173.
Toona sinensis, 51823.
Trichilia sp., 52225.
Trichodesma zeylanicum, 52226.
Tricholaena rosea, 51597.
Trichosanthes anguina, 51824–51827.
Trifolium sp., 51543.
tembense, 51545.
Triticum aestivum, 51418, 51683–51695, 52227.
vulgare. See *T. aestivum*.

Ullucus tuberosus, 51403.
Undetermined, 51411–51414, 51461–51462, 51546–51550, 51552, 51555, 51588, 51654–51657, 52256–52262, 52264–52267, 52304.
Urena lobata, 52228.

Vaccinium floribundum, 51790.
Vallea stipularis, 51800.
Vernonia spp., 51457, 51544, 51653.
Vetch, bush, *Vicia sepium*, 52278.
common, *Vicia sativa*, 52276.
hairy, *Vicia villosa*, 52280.
Hungarian, *Vicia pannonica*, 52274.
purple, *Vicia atropurpurea*, 52269, 52275.
tufted, *Vicia cracca*, 52270.
Viburnum sp., 51853.
Vicia andicola, 51791.
atropurpurea, 52269, 52275.
cracca, 52270.
hirsuta, 52271.
hybrida, 52272.
macrocarpa, 52273.
pannonica, 52274.
sativa, 52276.
leucosperma, 52277.
sepium, 52278.
sylvatica, 52279.
villosa, 52280.
Vigna spp., 52233–52237.
cylindrica, 52229.
sinensis, 52230–52232.
Viola sp., 51855.
serpens, 51854.
Violet. See *Viola* spp.
Vitex cuneata, 51604.

Watermelon, *Citrullus vulgaris*, 51430, 51923.
Wheat, common, *Triticum aestivum*:
Batauwe, 51692.
Concurrent, 51685.
(Denmark), 51689.
Essex, 51687.
Geldersche Ris. 51688.
Imperial, 51684.
Imperial II D, 51690.
Matador, 51686.
Millioen II, 51691.
Millioen III B, 51683.
Millioen IV, 51693.
Pocho, 51418.
Squarehead, 51694.
(Sudan), 52227.
Wilhelmina, 51695.
Wrightia tomentosa, 52297.

Xanthosoma sagittaefolium, 51388.

Yam. See Acom.
Yautia, *Xanthosoma sagittaefolium*, 51388.
Ylang-ylang, *Canangium odoratum*, 51811.

Zea mays, 51458–51460, 51778, 52238–52254.
Ziziphus sp., 51408.
mucronata, 52255.
spina-christi, 51741.

Issued May, 1923.

U. S. DEPARTMENT OF AGRICULTURE.
BUREAU OF PLANT INDUSTRY.

INVENTORY

OF

SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM JANUARY 1 TO MARCH 31, 1921.

(No. 66; Nos. 52306 to 52854.)



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CONTENTS.

	Page.
Introductory statement	1
Inventory	7
Index of common and scientific names	85

ILLUSTRATIONS.

	Page.
PLATE I. An avenue of the Siamese maikrabao trees, which produce an oil very similar to that of the chaulmoogra tree. (*Hydnocarpus anthelminthica* Pierre, S. P. I. No. 52468)	32
II. The tocte, a native Ecuadorian walnut tree. (*Juglans* sp., S. P. I. No. 52611)	32
III. The chamburo, an interesting relative of the papaya. (*Carica* sp., S. P. I. No. 52716)	66
IV. Fruits of the babaco, one of the most valuable species of Carica cultivated in Ecuador. (*Carica* sp., S. P. I. No. 52721)	66
V. A red-fruited variety of the Andes berry. (*Rubus glaucus* Benth., S. P. I. No. 52734)	66
VI. The talipot palm of tropical Asia. (*Corypha umbraculifera* L., S. P. I. No. 52802)	66
VII. The chaulmoogra tree of Burma. (*Taraktogenos kurzii* King, S. P. I. No. 52803)	78
VIII. Fruits of the chaulmoogra tree. (*Taraktogenos kurzii* King, S. P. I. No. 52803)	78

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INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM JANUARY 1 TO MARCH 31, 1921 (NO. 66; NOS. 52306 TO 52854).

INTRODUCTORY STATEMENT.

During the 73 working days of which this inventory is a record 549 new lots of plant immigrants arrived in Washington and were inspected, fumigated, labeled, and planted in the various gardens of the Office of Foreign Seed and Plant Introduction. They came from all over the world, recommended for some particular purpose, and those which we are able to propagate will go out to the regions best suited to their culture and find their way into the hands of bona fide plant experimenters, who will do something with them.

Forest trees.—To those who realize that it may not necessarily be our own native forest trees which will prove best adapted for forest purposes, the following new introductions will be of interest: The Canary Islands pine, *Pinus canariensis* (No. 52817), has been very successfully grown in South Africa and Chile as a timber tree, and its valuable hard wood may make it a species worth growing extensively in southern California.

Of interest to lovers of fine conifers are the following: The characteristic spruce of the great Tianshan Mountain range of Turkestan, *Picea schrenkiana* (No. 52659); a variety of the Siberian fir from the Amur River, *Abies sibirica nephrolepis* (No. 52623); a species from the Szechwan Province of China, *Abies faxoniana* (No. 52622); and a rare one from the Min Valley of China, *Abies recurvata* (No. 52624)—the last three presented by the Hon. Vicary Gibbs, of Elstree, England. It is to be hoped that we can find a place in this country for the Taiwania (*T. cryptomerioides*, No. 52570), which is, according to E. H. Wilson, who secured seeds and plants on his last expedition, the loftiest tree of the Formosan forest. It resembles a giant lycopod, reaches a height of 180 or even 200 feet, and has a girth of 30 feet. We are indebted to the Arnold Arboretum for propagating material of this species.

For the cool coastal regions of the Pacific coast the Chilean evergreen beeches (*Nothofagus* spp.) appear to be particularly well adapted,

and F. Albert, consulting forester to the Chilean Government, has sent in three of these species, the coigue (*N. dombeyi*, No. 52592), the roble (*N. obliqua*, No. 52593), and the rauli (*N. procera*, No. 52594), as well as a number of other Chilean trees and shrubs, including the tique (*Aextoxicon punctatum*, No. 52556), the beautiful tara (*Caesalpinia pectinata*, No. 52587), and an attractive liliaceous shrub (*Philesia magellanica*, No. 52596), remarkable in its ability to withstand the fumes from copper-smelting furnaces.

The growing interest in hybrid trees for forestry work as well as for street tree planting will make the hybrid poplar (*Populus rasumowskiana*, No. 52705), a cross between *P. nigra* and *P. suaveolens*, and the hybrid walnut (*Juglans intermedia vilmoreana*, No. 52681), sent in by Vilmorin-Andrieux & Co., of value to parks and forests.

J. F. Rock, our agricultural explorer, secured in Bangkok, Siam, seeds of the giant forest tree *Castanea diversifolia* (No. 52387), which bears quantities of edible chestnutlike nuts; and from the same region he obtained *Quercus junghuhnii* and other species of oaks (Nos. 52440 to 52448), bearing sweet edible acorns in great clusters, which might take the place of the scrub oaks of the pinelands of Florida.

We are so accustomed to think of the forests of Africa as trackless and inexhaustible that to learn of the threatened extinction in Rhodesia of the magnificent Milanji cypress (*Callitris whytei*, No. 52807), which grows to 140 feet in height at altitudes of 10,000 feet, comes as a distinct shock. It should make us realize, perhaps, that the virgin forests of the whole world are threatened by fire and the strangling grasses which man is taking into them. At least an effort can be made to save this cypress from extinction.

Grains.—The rise of plant-breeding institutions is a thing of recent times, and it is encouraging to note that already a free exchange has begun of the seeds and plants which are being produced by them in various countries. From the two foremost institutions in the Netherlands, those at Groningen and Bussum, have been received valuable collections (Nos. 52818 to 52840, 52842 to 52844) of their best selected strains of wheat, oats, barley, and flax, which can scarcely fail to be valuable in some of the cooler summer regions of America; whereas from the famous Australian plant breeder Pridham have come nine pure-line selections of the Hard Federation wheat (*Triticum aestivum*, Nos. 52557 to 52565) which has proved to be an improvement over the old Federation and which has been grown commercially in Australia since 1914 because of its equal yields and the better milling quality of the grain. Professor Ducellier, of the School of Agriculture of Maison Carree, Algiers, has presented a collection of 11 varieties of Saharan wheats (*Triticum* spp., Nos. 52546 to 52556)

with yields comparable to the best European varieties. What will happen to the black rice of Burma (No. 52751), which Mr. Rock found and used with keen relish as a breakfast dish at Moulmein, time only can decide. He declares it is a grain especially prized in Siam and when served as he used it is particularly delicious. What might it be when puffed?

The fundi grass of Sierra Leone, *Digitaria exilis* (No. 52736), which is grown by the Nigerian tribe as a supplemental food grain, may prove too expensive for production on a large scale because of the small size of its kernels; but, like the Abyssinian teff, it deserves to be thoroughly investigated as having possibly some particular use for invalids.

Forage and fodder plants.—Fodder trees have received little attention in this country, though in the drier parts of India and Australia much use is made of them. Two new ones from New South Wales, the leopard tree, *Flindersia maculosa* (No. 52798), and the myall, *Acacia pendula* (No. 52800), deserve study by the ranchmen of the extreme Southwest, where fodder grasses are scarce, since in years of unusual drought these trees can tide over the stock until rains come. They have nutrient values of 48.5 and 29, respectively, and will stand periods of prolonged drought.

Vegetables.—Why should we not use the old-fashioned potherb Good King Henry, *Chenopodium bonus-henricus* (No. 52789)? It is extremely hardy and two weeks earlier than asparagus produces shoots that are easily blanched and have a delicious flavor. It is related to our own lamb's-quarters, *C. album*, which is also excellent.

Tomato growers may be interested in Mr. Harrison's giant tomato bush (No. 52334) which in the frostless region of Burringbar, New South Wales, produced in 12 months a plant 16 feet across and 11 feet high that bore 100 dozen fair-sized fruits.

Nut-producing plants.—*Telfairia pedata* (No. 52450), a cucurbit growing like a liana in the tropical forests of East Africa and producing immense fruits which are filled with large flat edible seeds, although brought to the attention of horticulturists in 1824 seems nowhere to have been cultivated. It deserves a thorough trial. There is something alluring in the idea of replacing the scrub oaks of the pinelands of Florida with the deciduous oaks of Siam (Nos. 52440 to 52448) which produce great masses of sweet edible acorns.

Dye and tannin plants.—Mr. Rock's account of the black dye made from a tropical species of persimmon, *Diospyros mollis* (No. 52510), a substance whose color is so prized by the Chinese that they ship into Siam yearly over $800,000 worth of silk and pay duty on it in order to have it dyed there, should attract the attention of the manufacturers of dyes. Seed of the tree to grow in Porto Rico and Hawaii was secured.

The currebau-sevil (*Piptadenia cebil*, No. 52504) of Bolivia, which, according to Mr. Meschrutz, yields one of the best tanning materials, is a tree adapted to growing on stiff clay soils where little rain falls.

Medicinal plants.—In this inventory is described the chaulmoogra oil-producing tree, *Taraktogenos kurzii* (No. 52803), to secure which J. F. Rock made his expedition into Siam, Burma, and Assam. He also collected *Hydnocarpus anthelminthica* (No. 52465), the Siamese maikrabao tree, and *H. castanea* (No. 52514), one of the kalaw trees of Burma, from both of which similar oils are obtained. Where in America these trees can be grown is a problem to be solved by trial only. The Hawaiian Islands, Porto Rico, the Philippines, and the Canal Zone are presumably the logical places for them, and it is in these regions, too, that there is the keenest interest in the cure of leprosy. However, it is contemplated that specimens will be sent to other countries in order to make sure that these valuable drug-producing trees find a congenial home and come into cultivation where they can furnish an adequate number of seeds to supply the demand created by the new discoveries in the methods of treating this loathsome bacterial disease.

Fruits.—At first thought there does not seem to be a very large number of different kinds of fruits in cultivation by civilized man, but there really are a great many. The introductions for the three months covered by this inventory include, for example, 16 rare or little-known species or varieties. Wilson Popenoe introduces the capulin, or Ambato cherry, a form of *Prunus serotina* (No. 52720) which, though from a region of little frost, bears prodigious crops of fruits as large as the Early Richmond cherry and may prove to be the southern cherry of the future. He finds the Andes berry, *Rubus glaucus* (Nos. 52733 and 52734), as good as any of our cultivated species. The babaco (No. 52574) and the chamburo (No. 52721), both interesting species of Carica from Ambato, Ecuador, have a degree of hardiness which should insure their success in California, and although they are quite different from the true papaya, being edible only when cooked, they should prove valuable additions to our horticulture either directly or through hybridization. They will probably not compare directly with the Solo papaya of Hawaii (No. 52620), a selected uniformly shaped fruit of excellent quality which is recommended by the territorial experiment station for general cultivation because of its hermaphrodite flowers and the fact that the variety comes reasonably true from seed.

An attractive Syrian species of Sorbus, *S. trilobata* (No. 52600), Professor Poirault presents as one bearing fruits suitable for preserves; and M. Auguste Chevalier, of Paris, has sent us the seeds

of a wild peach from Annam (No. 52339), probably a form of *Amygdalus persica*, and seeds of a wild apple, *Malus laosensis* (No. 52341), from the Laos country of French Indo-China. These can scarcely fail to attract the attention of southern fruit breeders.

J. A. Kusche has collected for the Hawaiian Sugar Planters' Association much interesting material (Nos. 52399 to 52421), part of which through the courtesy of Dr. Harold L. Lyon has come into our hands. The interesting things of this collection are a new edible species of fig (No. 52406) with dark crimson-colored fruits, from Cairns, North Queensland, and several species of trees from Prince of Wales Island, which have not yet been determined. Through Vilmorin-Andrieux & Co., we have received a valuable collection of rare plants, including two species of strawberries (Nos. 52679 and 52680) from Sikkim and China and six species of the genus Ribes (No. 52706 to 52711), including one (*R. longeracemosum*) whose remarkably long racemes of currants should make it of great value for breeding purposes, according to E. H. Wilson, who saw it in fruit in western Hupeh, China.

Plants for parks and dooryards.—In the selection of ornamental plants for introduction attention is paid particularly to those which are capable of wide popularization among people of small means. Of these, the following notable ones are described in this inventory: A new ever-blooming morning-glory, *Ipomoea* carnea (No. 52493), found by Mr. Rock in Burma and probably suited to southern Florida; a beautiful arboreal red-flowered cotton (No. 52384) from Wat Lum, on the Menam River; *Thespesia lampas* (No. 52386), a tree related to two species which have proved already to be promising shade and ornamental trees in southern Florida; 11 species (Nos. 52690 to 52700) of the genus Caragana, among which is the Siberian pea tree (*C. arborescens*), one of the most important hedge and shelter-belt bushes of Canada and the Northwest; *Rhododendron racemosum* (No. 52603), a beautiful species from Yunnan with small, pink, sweet-scented flowers, which blooms when still small enough to be handled in pots and exhibits a variety of colors resembling the well-known *R. vaseyi;* two species of Bauhinia (Nos. 52746 and 52747) and one of the crape myrtle, *Lagerstroemia* sp. (No. 52750), from Moulmein, Burma; a collection of the small hardy ornamental bamboos of the genus Arundinaria (Nos. 52670 to 52674); *Cassia nodosa* (No. 52797), a gorgeous flowering tree from eastern Bengal; a species of horse-chestnut, *Aesculus indica* (No. 52625), which flowers later than the European species and grows in northern India to a height of 100 feet; the yellow-flowered clematis, *C. tangutica* (No. 52631); the yellow-flowered peony, *Paeonia lutea* (No. 52648); and a collection of the famous Lemoine's hybrid mock oranges (*Philadel-*

phus lemoinei, Nos. 52649 to 52657), which deserve a place in every nursery of ornamental plants in America.

The botanical determinations of these introductions have been made and the nomenclature revised by H. C. Skeels and the descriptive and botanical notes arranged by G. P. Van Eseltine, who has had general supervision of this inventory. Miss Patty Newbold has assisted in the compilation of descriptive notes.

DAVID FAIRCHILD,
Agricultural Explorer in Charge.

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION,
Washington, D. C., November 20, 1922.

INVENTORY.[1]

52306. Stachys sieboldi Miquel. Menthaceæ.

From Paris, France. Tubers purchased from Vilmorin-Andrieux & Co. Received February 1, 1921.

A perennial Japanese plant up to 1½ feet in height, cultivated for its slender white tubers, which are eaten as salad, fried, and in many other ways. Cultivation is easy. The soil should be light and the plants spaced a foot apart. The tubers are dug in November or later. They shrivel on exposure to the air and should be taken only as wanted. (Adapted from *Catalogue, Vilmorin-Andrieux & Co.*)

52307 to 52309.

From Cali, Valle, Colombia. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received January 3, 1921. Quoted notes by Mr. Popenoe.

52307. Agati grandiflora (L.) Desv. Fabaceæ.
(*Sesbania grandiflora* Poir.)

"(No. 520a. November 22, 1920. Herb. No. 1205.) Seeds of *regenerador*. A handsome flowering tree cultivated in the lower portion of the Cauca Valley, especially in the vicinity of Cartago (whence these seeds) and Roldanillo. It reaches a height of about 25 feet and has handsome pinnate foliage. The pure-white flowers, 2 inches long, are shaped much like those of Clianthus and something like those of Erythrina. A rose-colored form is also cultivated, but I have been unable to get seeds of it. The tree is remarkable in that it commences to flower when not more than 3 feet high. It is a rapid grower, and when properly trained (it is inclined to be rather tall and slender in form) it is shapely and very attractive. I believe it would be a distinct addition to the ornamental trees of southern Florida."

For previous introduction, see S. P. I. No. 38656.

52308. Brownea grandiceps Jacq. Cæsalpiniaceæ.

"(No. 519a. November 22, 1920.) Seeds of *arbol de la Cruz*, a tree cultivated in a dooryard at Cartago, at an altitude of about 2,900 feet. This magnificent flowering tree, native to the Magdalena Valley in Colombia, is a common ornamental in the Cauca Valley at altitudes of 2,500 to 4,000 feet. It is about 20 feet in height and produces flame-

[1] It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in this inventory are those under which the material was received when introduced by the Office of Foreign Seed and Plant Introduction and, further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in this inventory will be subject to change with a view to bringing the forms of the names into harmony with recognized American codes of nomenclature.

52307 to 52309—Continued.

scarlet flowers in compact clusters (they could almost be termed heads) 6 to 8 inches long and broad. While this plant is tropical, the fact that it is grown at Guaduas makes me think that it may succeed in southern Florida."

For previous introduction, see S. P. I. No. 51796.

52309. CARICA sp. Papayaceæ.

"(No. 512a. November 22, 1920.) From a dooryard in Ibague, Department of Tolima, Colombia, at an altitude of about 4,200 feet. Seeds of a distinct species of Carica which I have not seen in Cundinamarca. At first sight I took it to be *C. candamarcensis* (the species common in Cundinamarca), but on closer examination the leaves proved to be much more deeply lobed and the fruit altogether distinct in character, though of about the same size and form. The plant is common in the region between Ibague and the Cauca Valley, being found at altitudes of 4,000 to 6,000 feet. It reaches about 15 feet in height, often branching near the base to form several stems. So far as I have seen, the plants are unisexual, as in *C. candamarcensis* and, normally, in *C. papaya*. The fruits are broadly oval to elliptic, 3 to 5 inches long, and deep yellow when fully ripe. The flesh is white and has a faint applelike odor. The seeds are scattered through a white pulpy mass, which does not adhere to the wall of the cavity but is attached at the basal end. The flavor of the flesh is rather acid; it is eaten only when cooked, as that of *C. candamarcensis* in Bogota.

"I do not know how hardy the plant may be. It seems likely that it will resemble *C. candamarcensis* in hardiness, and in this case it will be of interest in connection with papaya breeding in Florida and California."

52310 to 52314. ALLIUM spp. Liliaceæ.

From Paris, France. Purchased from Vilmorin-Andrieux & Co. Received February 1, 1921. Quoted notes from Catalogue of Vilmorin-Andrieux & Co.

A collection of vegetables introduced for experiments in diseases of truck crops and for vegetable breeding experiments.

52310. ALLIUM ASCALONICUM L. **Shallot.**

"*Echalote de Jersey.* Bulbs of a variety which is larger and more highly colored than the ordinary shallot and a very good keeper."

52311. ALLIUM CEPA L. **Onion.**

"*Rocambole.* Bulbs of a variety from Spain. Plant in October or November, or in February."

52312 to 52314. ALLIUM FISTULOSUM L. **Welsh onion.**

52312. "*Ciboule commune.* Bulbs of the variety most cultivated."

52313. "*Ciboule blanche hative.* Bulbs of an early and less pungent variety."

52314. "*Ciboule vivace* (*Ciboule de Saint-Jacques*). Bulbs of a variety which does not produce seeds."

52315 to 52317. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From Cali, Valle, Colombia. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received January 3, 1921. Quoted notes by Mr. Popenoe.

52315 to 52317—Continued.

52315. "(No. 524. November 22, 1920.) Tubers of an excellent potato grown in the mountains near Cali. The tubers attain large size compared with other Colombian potatoes and are oblong or oval, distinctly compressed, and light brown in color. The surface is remarkably free from eyes, being in fact nearly smooth. The flesh is white and of good quality. I am told by some people that this is not a native variety, but one which has been introduced into the valley fairly recently. In any event, it is worthy of trial in the United States by those interested in potato breeding."

52316. "(No. 525. November 22, 1920.) *Papa criolla* (native potato) from the Cali market. Tubers of the common yellow-fleshed potato of the Andes, a variety which produces tubers of small size but remarkably rich flavor. This variety is said to be very early and to be suited to cultivation in a warmer climate than others. The tuber is round, commonly not over 3 inches in diameter, deep rose colored, with very deep eyes, a very thin skin which peels readily from the boiled tuber, and mealy flesh of rich-yellow color and excellent quality. It appears to me a very interesting variety for trial in the United States."

52317. "(No. 526. November 22, 1920.) Tubers of *papa criolla* (native potato). From the Cali market. A round to oblong, medium-sized, brown-skinned, deep-eyed potato from market. It appears practically identical with No. 525 [S. P. I. No. 52316] except in the color of the surface. The flesh is yellow, of excellent quality, and of remarkably rich flavor."

52318 to 52329.

From Coggeshall, Essex, England. Seeds presented by John K. King, of King & Sons. Received January 3, 1921. Notes adapted from King & Sons' "Pedigree Seed Wheats," 1920–21.

52318 to 52327. TRITICUM AESTIVUM L. Poaceæ. Common wheat. (*T. vulgare* Vill.)

52318. *Benefactor.* This wheat ripens fairly early and on good soils produces a fair yield. The ear is of medium length, with rough chaff and white plump grains of good size. The straw is very strong and of medium length. (P. 7.)

52319. *Essex Conqueror.* A new wheat which yields 80 bushels per acre. The well-set compact ears, some nearly 6 inches long and 5 to 7 chested, are well filled with bold plump red grain of superior milling properties; the chaff is white. The strong stiff straw is of medium height and upstanding in the most severe weather. (P. 2.)

52320. *Iduma Red.* A red wheat which produces good upstanding straw and fairly large ears; the grain is of excellent milling quality, and the chaff is white. (P. 7.)

52321. *Improved Double Stand-up White.* This wheat has a short stiff straw and a rather short ear well set with pale-white grain. (P. 7.)

52322. *John Bull.* An early strong wheat which yields as much as 60 bushels per acre. The straw reaches a height of 5 feet or more, and the large heads with white chaff are closely set with the finest large red grain, which is of high value for milling. (P. 3.)

52318 to 52329—Continued.

52323. *Little Joss*, A cross between *Squareheads Master* and *Ghirka*, raised by Professor Biffen. This variety is said to be rust resistant, and the quality of the grain is unquestionably good; the ears are long and somewhat pointed, which quality in our judgment detracts from its cropping properties. (P. 7.)

52324. *Marshal Foch.* A fairly early wheat, ripening about the same time as Victor, with white chaff and pale-red grain, said to be of good milling quality. The strong stiff straw is of medium length. (P. 7.)

52325. *Reselected Victor White.* A fairly early wheat which gives excellent results on most soils. The straw is of medium length, and the square compact ears bear medium-sized grain. (P. 7.)

52326. *Snowdrop White.* A white wheat, something over 5 feet high and very level, yielding up to 80 bushels per acre. The square thick ears are of good length. The pearly white grains are compactly set and often 5 or 6 chested; it is eagerly sought after by millers. The straw is very strong and free from rust. (P. 4.)

52327. *White Marvel.* Of the two, we consider this variety to be better than *Red Marvel.* It possesses all the characteristics of *Red Marvel*, but the grain is white. The straw is stiff, and the ear, although long, is generally fairly thick chested. The variety is exceedingly valuable for spring sowing. (P. 7.)

52328 and 52329. TRITICUM TURGIDUM L. Poaceæ. **Poulard wheat.**

52328. *Percival's Red Cone.* After careful experiments on our Experimental Farms, we do not recognize any great difference between this and a good stock of the ordinary *Cone.* (P. 7.)

52329. *Early Red Cone.* This variety is said to ripen 10 days before ordinary *Rivetts*, but we did not find it so early. The heads are close and compact, and the straw is somewhat shorter than *Rivetts.* (P. 7.)

52330. DATURA METEL L. Solanaceæ. **Datura.**

From Manila, Philippine Islands. Seeds presented by Sr. Adn. Hernandez, Director of Agriculture. Received January 5, 1921.

"This Asiatic plant, described as a distinct species by Nees, is regarded by some botanists as a white-flowered form of *Datura metel.* It is identical with the plant known to the Japanese by the name 'Chosen Asagao,' or 'Korean morning-glory.'" (*W. E. Safford.*)

52331. EUTERPE sp. Phœnicaceæ. **Assahy palm.**

From Para, Brazil. Seeds presented by Dr. Paul Le Cointe, director, Commercial Museum. Received January 6, 1921.

"Fresh seeds of the *assahy palm.*" (*Le Cointe.*)

52332. COLOCASIA ESCULENTA (L.) Schott. Araceæ. **Taro.**

From Canton, China. Tubers presented by F. A. McClure, instructor, Canton Christian College. Received January 7, 1921.

"This taro, or dasheen, is known locally by the name *tso oo.* The small tubers that grow out from the 'eyes' of the mother tuber are called *oo tsai.*

It is these that I am sending. This variety of taro is common in all parts of Kwangtung and Kwangsi and is the earliest variety known here. Its quality, however, is only medium, compared with that of the later varieties. The taro prefers a loose sandy soil and is sometimes grown along with ginger, bean, or Chinese melons, in various companion-cropping systems. The fertilizers commonly used are ashes from rice straw, horse manure, and night soil. The average yield per mow (one-fifth acre) is about 20 taams, or 2,600 pounds. Of these, about one-half are the large 'mother' tubers [corms] and about one-half are the new small tubers, or *oo tsai*. The large ones are fed to hogs largely, because of their inferior quality and coarseness. They bring an average price of $1.60 local silver (about $1 G.) per 130 pounds. The small ones are used for human consumption, and they bring about $2 local silver per 130 pounds. In selecting for seed, the largest and finest tubers are chosen, those which have a red swollen sprout at the top being preferred. The crop is planted here in February and March, and the harvest is ready by June and July." (*McClure.*)

"Leaf stem deep purplish maroon, shading into green near the blade, and with conspicuous band of bright green at base. Petiolar sinus grayish white with network of purplish veins. Petiolar spot on blade indistinct or absent." (*R. A. Young.*)

52333 and 52334.

From Burringbar, New South Wales, Australia. Seeds presented by B. Harrison. Received January 7, 1921.

52333. ACACIA sp. Mimosaceæ. Wattle.

"A creeping wattle, rooting at the joints, which should prove useful as a sand binder. It grows to a height of about 3 or 4 feet on the beach here." (*Harrison.*)

Received as *Acacia procumbens*, for which a place of publication has not been found.

52334. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. Tomato.

"*Harrison's Prolific.* This tomato is a rapid grower and in our district, which is subtropical, grew in 12 months to the height of 11 feet, attained a spread of 16 feet, and produced 100 dozen fair-sized fruits. It commences to bear when only 9 to 12 inches in height and branches profusely both close to the ground and along the stems. The fruit is scarlet, very fine flavored, and about 4 or 5 inches in circumference. The first plant attracted a great deal of attention from residents for miles around, who declared they had never before seen anything approaching it. The soil where the plant grew was well drained and had been lightly burned over, which was probably the cause of the vines thriving so well and escaping any disease." (*Harrison.*)

52335. TRIFOLIUM SUBTERRANEUM L. Fabaceæ.

Subterranean clover.

From Melbourne, Victoria, Australia. Seeds purchased from F. H. Brunning. Received January 10, 1921.

"One of the most nutritious plants known to agriculture, indigenous to Britain and found growing on dry, sandy, and gravelly soil. The stems grow over each other to a depth of 6 or 7 inches, the lower ones being as healthy as those above." (*Brunning.*)

52336 and 52337.

From Cambridge, England. Seeds presented by F. G. Preston, Botanic Garden. Received January 8, 1921.

52336. BERBERIS BREVIPANICULATA C. Schneid. Berberidaceæ. **Barberry.**

A shrub from western China with tawny glabrous young branches, later becoming furrowed and ash colored, and graceful golden yellow spines. The oblong, entire, clustered leaves are 10 to 30 millimeters long, shining above, distinctly glaucous, and with a bloom. The small graceful flowers are in panicles which are sometimes 2.5 centimeters long. (Adapted from *Bulletin de l'Herbier Boissier, ser. 2, vol. 8, p. 263.*)

For previous introduction, see S. P. I. No. 38986.

52337. CLEMATIS TANGUTICA OBTUSIUSCULA Rehd. and Wils. Ranunculaceæ. **Clematis.**

A glaucous-green climbing shrub, native to central Asia, with leaves 3 to 5 inches long, consisting of lanceolate segments up to 2½ inches long, often lobed in one or both sides. The nodding solitary flowers are very large, on erect peduncles that are 6 inches long and arched at the tip. The oval-lanceolate, golden yellow sepals are 2 inches long with recurved tips. (Adapted from *Curtis's Botanical Magazine, pl. 7710.*)

52338. HOLCUS HALEPENSIS × SORGHUM. Poaceæ. **Sorghum.**

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received January 8, 1921.

"A perennial sorghum which appears to be interesting as a forage." (*Trabut.*)

For previous introduction, see S. P. I. No. 39588.

52339 to 52342.

From Paris, France. Seeds presented by M. Auguste Chevalier. Received January 11, 1921. Quoted notes by M. Chevalier.

52339. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

"A wild peach growing at an altitude of 1,000 meters in the mountains of Annam, French Indo-China."

52340. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

"A form improved under cultivation by the inhabitants of the mountains of Annam, French Indo-China. Grows at altitudes of 1,000 meters."

52341. MALUS LAOSENSIS (Cardot) Cheval. Malaceæ. **Apple.**

"A cider apple from Tranninh, Laos, French Indo-China."

52342. PYRUS PASHIA Buch.-Ham. Malaceæ. **Pear.**

A small tree common in Simla, Burma, North China, and in the temperate Himalayas at altitudes of 3,000 to 8,000 feet. The barren branchlets usually end in a spine. The simple, ovate or ovate-lanceolate, long-pointed leaves, 2 to 4 inches long, are tomentose when young, ultimately glabrous. The white flowers tinged with pink, 1 inch in diameter, are in simple corymbs of 10 or fewer. The yellowish brown apple-shaped fruits, half an inch to an inch in diameter, are rough with small white spots. (Adapted from *Collett, Flora Simlensis, p. 169.*)

For previous introduction, see S. P. I. No. 44052.

52343 to 52349.

From Buitenzorg, Java. Seeds presented by L. Koch, chief, Plant Breeding Station for Annual Crops. Received January 12, 1921. Quoted notes by Mr. Koch.

52343 and 52344. ARACHIS HYPOGAEA L. Fabaceæ. Peanut.

52343. "*Katjang Tanoh Toeban*, one of the best types of peanuts. The seed pods are formed close together like those of Spanish peanuts, which ripen here in about 80 days. This variety ripens in about 100 days. When harvested, almost all the seed pods are ripe, so that there is almost no loss from overripe or shriveled seeds." (*Koch.*)

52344. "*Katjang Tanoh Witte Bastaard No. 3.* One of the types obtained by crossbreeding white hybrid No. 3. This variety ripens in about 100 days; the seed pods are formed close together like those of Spanish peanuts and 'small Japan nuts.' When harvested almost all the seed pods are ripe, so that there is almost no loss from overripe or shriveled seeds." (*Koch.*)

52345 to 52349. SOJA MAX (L.) Piper. Fabaceæ. Soy bean. (*Glycine hispida* Maxim.)

52345. "*Witte Kedelei No. 18*, a variety imported from Formosa, which is late ripening, having a growing period of about 120 days."

52346. "*Zwarte Kedelei No. 15.* Selected Javanese variety which has a growing period of 95 to 100 days."

52345. "*White Kedelei No. 18*, a variety imported from Formosa, with a growing period of 95 to 100 days."

52348. "*Zwarte Kedelei No. 17a.* Imported from Formosa. This variety has a growing period of 95 to 100 days."

52349. "*Zwarte Kedelei No. 27.* Probably a Chinese variety, which has a growing period of 95 to 100 days. *Peking* ripens here in about 75 days."

52350 and 52351. SACCHARUM OFFICINARUM L. Poaceæ. Sugar cane.

From Fajardo, Porto Rico. Seeds presented by R. A. Vive, in charge, Experimental Station. Received January 15, 1921.

52350. "*Demerara 433.* A variety known to produce fertile seeds and juice of high density; the most tolerant to mosaic disease of any cane that we have." (*Vive.*)

52351. "*Demerara 109.* A variety known to produce fertile seeds and juices of high density. A very good germinator." (*Vive.*)

52352. DAVIDSONIA PRURIENS F. Muell. Cunoniaceæ.

From Burringbar, New South Wales. Seeds presented by B. Harrison. Received January 18, 1921.

"A palmlike tree with large long-lobed leaves at the top. The pear-shaped purple plums are borne on the trunk and even on the roots of the tree if these are exposed above the surface of the ground. The fruit juice makes a refreshing beverage for summer time and could also be used for coloring liquids, etc." (*Harrison.*)

52353. CASSIA EREMOPHILA A. Cunn. Cæsalpiniaceæ.

From New South Wales, Australia. Seeds presented by Hugh Dixson, Abergeldie. Received January 18, 1921.

"A yellow-flowered shrub, 5 feet high, which remains a long time in flower. The plant is native to the interior of New South Wales, so that it will stand heat and also temperatures as low as 15° F. I have only one plant, but it is so floriferous that I intend having more in the garden." (*Dixson.*)

For previous introduction, see S. P. I. No. 44071.

52354 and 52355. CORYLUS AVELLANA L. Betulaceæ. **Filbert.**

From Loiret, France. Plants presented by M. Edmond Versin. Received January 19, 1921.

52354. "*Précoce de Frauendorf.*" (*Versin.*)

52355. "*Princesse royale.*" (*Versin.*)

52356. TRIFOLIUM GLOMERATUM L. Fabaceæ. **Cluster clover.**

From Adelaide, South Australia. Seeds presented by J. F. Bailey, Director of Agriculture. Received January 19, 1921.

"Although this clover is to be found over considerable stretches of country in this State, there is only one district where it is anything out of the ordinary as a fodder plant, and this is a comparatively small strip of extremely fertile volcanic land between Mount Gambier and Mount Schank. Here, in most seasons, it covers much of the pasture land to the exclusion of most other plants, and after being grazed for some months will make a dense mass 2 to 2½ feet high, which is cut for hay. Other than in this particular strip of country, the clover is useful only because it grows fairly well in sour soils low in phosphate content, when these soils first come into cultivation and before the other clovers have established themselves." (*W. J. Safford, superintendent, Experimental Work, Adelaide.*)

For previous introduction, see S. P. I. No. 9756.

52357. ECHIUM VIOLACEUM L. Boraginaceæ.

From Cordoba, Cordoba Province, Argentina. Seeds presented by Dr. C. C. Hosseus, Academia Nacional de Ciencias, through Prof. C. V. Piper, Agrostologist in Charge, Office of Forage-Crop Investigations. Received January 21, 1921.

"A desirable ornamental, known in Brazil as *flor morado* (purple flower), and reported to be a valuable forage plant. It is native to the Mediterranean region of Europe and Africa and apparently introduced into Brazil, Uruguay, and Argentina. The plant is beautiful when in bloom." (*Piper.*)

52358 to 52361. LINUM spp. Linaceæ. **Flax.**

From Glasnevin, Dublin, Ireland. Seeds presented by F. W. Moore, director, Royal Botanic Garden. Received January 21, 1921.

52358. LINUM ALPINUM L.

A herbaceous plant found in fields on the Alps and Jura Mountains, with slender stems branching at the top and decorated with numerous narrow leaves; the large lilac-blue flowers are in lax clusters at the tips of the branches. It thrives in the sun and is much esteemed for rock gardens; it flowers from June until the winter and requires no care. (Adapted from *Correvon et Robert, Flore Alpine, p. 295.*)

52358 to 52361—Continued.

52359. LINUM GRANDIFLORUM Desf.

Variety *rubrum*.

"An erect, branching plant, 25 inches high, native to Algeria. The bluish green leaves are darker than those of *Linum usitatissimum*, and the plant is also later and less determinate in its blooming period; the flowers are much larger and of a deep-red color." (*J. C. Brinsmade, jr.*)

For previous introduction, see S. P. I. No. 38972.

52360. LINUM MUELLERI Moris.

A plant 1½ feet high, with shrubby branching stem, found in hilly grazing lands in Sardinia. The green glabrous leaves have revolute margins; the lower are elliptic, the upper linear-lanceolate. The yellow flowers are in lax terminal panicles. (Adapted from *Moris, Flora Sardoa, vol. 1, p. 358.*)

52361. LINUM USITATISSIMUM L.

A form introduced for flax investigations.

For previous introduction, see S. P. I. No. 50160.

52362. CRATAEGUS AZAROLUS L. Malaceæ. Hawthorn.

From Cefalu, Sicily, Italy. Seeds presented by Signor Salvatore Scalco, through E. M. Byrnes, assistant in charge, Experimental Gardens and Grounds, United States Department of Agriculture, Washington, D. C. Received January 24, 1921.

Among the species of Crataegus one of the most important is *C. azarolus*, with its numerous varieties and races. This is a shrub of the calcareous hills and grows only on very dry lands. If undisturbed, it grows as high as 13 to 16 feet, but its branches are generally hacked off for fuel by Arab women or mutilated by heavy stones thrown by the boys to shake down the fruit. Some varieties of *C. azarolus* have fruits as large as a large cherry, with a very agreeable acid taste. Although they are sold on the markets of the Orient, they would not be marketable in Europe or America because of the large stones; but specimens are often found which are nearly stoneless, and it is possible that this character could be fixed by selection. For 15 years or more the writer has used *C. azarolus* as a stock for pears with excellent results. Top grafted at 2 to 3 feet above the ground, it develops into a very beautiful, productive, and long-lived dwarf tree, provided the grafting is done with a very early variety. This shrub occurs in extremely hot, dry places, and must therefore complete the greater part of its development early in the season. Its roots therefore are unable to furnish the amount of sap necessary to develop pears in August. If, however, it is grafted with a pear which fruits in May or June, when the roots of the Crataegus are in their period of greatest activity, the best results are obtained. The writer speaks only of pears because he has experimented with them, but he sees no reason a priori why these stocks should not do as well for apples, which he has not as yet tried. (Adapted from *Aaronsohn, Agricultural and Botanical Explorations in Palestine, Bureau of Plant Industry Bulletin No. 180, pp. 15–16.*)

For previous introduction, see S. P. I. Nos. 48516 and 48517.

52363. Dolichos lablab L. Fabaceæ. **Bonavist bean.**

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. Received February 4, 1921.

Lablab stringless. A tall twining plant, often reaching a height of 15 feet, with bunches of short, broad, yellowish white pods. The very numerous slightly downy pods contain brown seeds, half an inch broad and one-third of an inch thick, provided with a curious white aril or keel along one of the edges. (Adapted from *Vilmorin-Andrieux & Co., General Wholesale Seed List, 1920, p. 28.*)

52364 to 52366. Linum spp. Linaceæ. **Flax.**

From Amsterdam, Netherlands. Seeds presented by the director, Jardin Botanique de l'Université d'Amsterdam. Received January 25, 1921.

52364. Linum monogynum Forst. f.

1920 harvest.

A very desirable species native to New Zealand, which blossoms in the greenhouse in May and June and has a succession of large white flowers for a great length of time. The plant is 1½ feet high, with erect glaucous stems much branched at the top in a corymbose manner. The sepal margins are white and diaphanous; the handsome petals are broadly ovate-obtuse. (Adapted from *Curtis's Botanical Magazine, pl. 3574.*)

52365 and 52366. Linum usitatissimum L.

52365. A form introduced for experimental purposes; harvested in 1919.

For previous introduction, see S. P. I. No. 52361.

52366. Introduced for experimental purposes; from the 1920 crop.

For previous introduction, see S. P. I. No. 52361.

52367. Kennedia rubicunda (Schneev.) Vent. Fabaceæ.

From San Francisco, Calif. Seeds presented by Miss Alice Eastwood. Received January 25, 1921.

A tender, hairy twiner, native to Trinidad. The dark-purple flowers, with oblong, revolute standard and linear-oblong wings and keel, are borne in silky racemes shorter than the three-parted leaves. (Adapted from *Edwards's Botanical Register, pl. 1101.*)

For previous introduction, see S. P. I. No. 49487.

52368. Populus euphratica Oliver. Salicaceæ. **Poplar.**

From Algiers, Algeria. Cuttings presented by Dr. L. Trabut. Received January 26, 1921.

This Algerian tree attains a height of 50 feet. The wood is harder than that of most other poplars. It is used for planking and boat building, also for beams, rafters, boxes, paneling, and turnery. On account of its lightness the wood is frequently used for rafts. Cattle browse on the leaves. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 417.*)

For previous introduction, see S. P. I. No. 30054.

52369 to 52374. Linum spp. Linaceæ. **Flax.**

From Edinburgh, Scotland. Seeds presented by Dr. Isaac Bayley Balfour, director, Royal Botanic Garden. Received January 26, 1921. Quoted notes by J. C. Brinsmade, jr., Office of Cereal Investigations, Bureau of Plant Industry.

52369 to 52374—Continued.

52369. LINUM FLAVUM L.

"A perennial branching plant native to Europe, 5 to 10 inches high, with large yellow flowers."

52370. LINUM GRANDIFLORUM Desf.

Variety *rubrum*. Introduced for flax investigations.

For previous introductions, see S. P. I. No. 52359.

52371. LINUM MONOGYNUM Forst. f.

A form introduced for experimental purposes.

For previous introduction, see S. P. I. No. 52364.

52372. LINUM PERENNE L.

Variety *sibiricum*.

"An erect, branching compact plant, 6 to 12 inches high, with blue-green leaves and purple flowers. Native to Europe."

This species is much esteemed for rock gardens. It flourishes in the sun and flowers from June until the winter without requiring any care. (Adapted from *Correvon et Robert, Flore Alpine, p. 295.*)

52373. LINUM TENUIFOLIUM L.

This plant differs from *Linum alpinum* in its shorter, more slender stems, its longer, narrower leaves rough at the edges, and in its rose-lilac fugacious corolla. It grows on the warm sunny slopes of the lower regions of the Alps and Jura Mountains. It is cultivated for rock gardens, requires no care, and flowers from June to winter. (Adapted from *Correvon et Robert, Flore Alpine, p. 295.*)

52374. LINUM USITATISSIMUM L.

Introduced for the Office of Cereal Investigations.

For previous introduction, see S. P. I. No. 52365.

52375 and 52376.

From Cambridge, England. Seeds presented by J. Burtt Davy. Received February 2, 1921.

52375. ANNONA CHERIMOLA Mill. Annonaceæ. **Cherimoya.**

"Seeds of a custard-apple from Madeira; I do not know that it is better than any others, but it might be of use to anyone working on this fruit." (*Davy.*)

52376. VIRGILIA CAPENSIS (L.) Lam. Fabaceæ.

"A very ornamental strain of the *keurboom* from South Africa, which may prove useful in Hawaii and ornamental in Florida and southern California as a flowering tree." (*Davy.*)

For previous introduction, see S. P. I. No. 48188.

52377. DIOSPYROS EBENASTER Retz. Diospyraceæ. **Black sapote.**

From Honolulu, Hawaii. Seeds presented by Gerrit P. Wilder. Received February 4, 1921.

One of the most popular fruits of Mexico, where it is grown at altitudes up to 6,000 feet. In favorable situations the tree reaches a height of 60 feet. The bright-green, shining elliptic leaves are 4 to 8 inches long. The oblate, olive-green thin-skinned fruit is 2 to 5 inches in diameter. The soft, unctuous, dark chocolate-brown pulp is of sweet flavor somewhat similar to that of the kaki, but

scarcely so pleasant. This fruit is eaten fresh but is more highly esteemed by Europeans when the pulp is beaten with a small quantity of orange or lemon juice and served as a dessert. It should be chilled thoroughly before being served. (Adapted from *Popenoe, Manual of Tropical and Subtropical Fruits, p. 370.*)

For previous introduction, see S. P. I. No. 49480.

52378. JUNIPERUS THURIFERA L. Pinaceæ. **Juniper.**

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received February 4, 1921.

"Found at Awies, at an altitude of 1,800 meters." (*Trabut.*)

A tree 5 to 10 meters high, with a thick trunk and a rounded or flattened crown. The light-brown or bluish pruinose fruits are erect or horizontal. Native to Spain. (Adapted from *Lázaro, Compendio de la Flora Española, vol. 1, p. 594.*)

52379. STACHYS SIEBOLDI Miquel. Menthaceæ.

From Paris, France. Tubers purchased from Vilmorin-Andrieux & Co. Received February 5, 1921.

A perennial, growing 10 to 18 inches tall, with creeping rootstocks. It is cultivated for its 2 to 3 inch slender nodose white tubers. These tubers soon shrivel when exposed to the air and should be lifted only when wanted. They are eaten cooked in different ways or as a salad. (Adapted from *Vilmorin-Andrieux & Co., General Wholesale Seed List, p. 53.*)

For previous introduction, see S. P. I. No. 50541.

52380 to 52382. LINUM spp. Linaceæ. **Flax.**

From Stockholm, Sweden. Seeds presented by Dr. Robert E. Fries, director, Hortus Botanicus Bergianus. Received February 8, 1921.

52380. LINUM AUSTRIACUM L.

A perennial herb found in Vizcaya and Catalonia, Spain, with an almost woody root, linear-lanceolate leaves, and nearly corymbose racemes. The violet-red or light-blue petals are ovate-rounded. (Adapted from *Lázaro, Compendio de la Flora Española, vol. 2, p. 296.*)

52381. LINUM FLAVUM L.

This form was introduced for experimental purposes.

For previous introduction, see S. P. I. No. 52369.

52382. LINUM USITATISSIMUM L.

Introduced for experimental purposes.

For previous introduction, see S. P. I. No. 52374.

52383. MISCANTHUS CONDENSATUS Hack. Poaceæ. **Plume-grass.**

From Yokohama, Japan. Seeds presented by S. Iida, manager, Yokohama Nursery Co. Received February 9, 1921.

"A grass native to Hachijo Island (also at the latitude of Tokyo) of an evergreen and tender nature, and with a wider blade and thicker stalk than is found in our common Miscanthus. It is extensively cultivated as fodder; cattle like it better than cornstalks. The excellent quality of the milk products of the island is said to be due to this grass." (*Iida.*)

52384 to 52386.

From Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received January 20, 1921.

52384. GOSSYPIUM ARBOREUM L. Malvaceæ. **Tree cotton.**

"At Wat Lum, Siam, along the Menam River, I found an interesting cotton plant 10 to 12 feet high, worthy of cultivation on account of its beautiful red flowers. There were very few seeds, but I am sending some." (*Rock.*)

For previous introduction, see S. P. I. No. 34184.

52385. SOLANUM MAMMOSUM L. Solanaceæ.

"From Champorn, Lower Siam. An ornamental plant with peculiar fruits having fingerlike protuberances at the stem end." (*Rock.*)

For previous introduction, see S. P. I. No. 48145.

52386. THESPESIA LAMPS (Cav.) Dalz. and Gibs.

"An ornamental shrub 5 to 8 feet in height, with large yellow flowers. It is common in the forests of northern Siam." (*Rock.*)

A small bush common in the tropical jungles of India, Burma, and Ceylon, from Kumaon eastward, ascending to 3,000 feet in Nepal. The young twigs yield a good fiber. The root and fruit are used medicinally. The tough pliant wood is much used in certain parts of Bombay Province for making drums. (Adapted from *Watt, Dictionary of the Economic Plants of India, vol. 6, pt. 4, p. 45.*)

For previous introduction, see S. P. I. No. 26166.

52387 to 52391.

From Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received January 20, 1921. Quoted notes by Mr. Rock.

52387. CASTANEA DIVERSIFOLIA Kurz. Fagaceæ.

"(No. 81. From Bangkok, Siam.) Mighty trees with wonderful crowns, straight trunks, and fine wood. The nuts are quite sweet and very tasty when roasted. The trees are prolific bearers, and seeds are plentiful just now."

52388 and 52389. CITRUS GRANDIS (L.) Osbeck. Rutaceæ. **Pummelo.**

(*C. decumana* Murr.)

52388. "(From Nakon Chaisri, Siam.) *Nakon Chaisri* pummelo, grown in Nakon Chaisri, and presented by Dr. Yai, Minister of Agriculture, who has a garden up the Menam River 8 miles from Bangkok. There are three distinct seasonal crops, and I was told that the crop borne during the rainy season usually produced seeds, while in the other seasons the fruits are seedless. Dr. W. A. Graham, agricultural adviser, says that the formation of seeds is due to pollination by a fly, which is apparently absent at other seasons.

"Doctor Yai, who is an expert on pummelos, etc., says that when plants of this pummelo are brought to and planted in Bangkok, they change their character entirely and become quite a different thing; that the trees, in fact, bear fruits identical with a pummelo long cultivated in Bangkok and known as *Ban Kun Non*. Doctor Yai thinks that the *Nakon Chaisri* pummelo originated from this

52387 to 52391—Continued.

Ban Kun Non and that when brought to Bangkok from Nakon Chaisri, only an hour or so distant by rail, it reverts to the *Ban Kun Non*. The *Nakon Chaisri* pummelo can not be shipped for various reasons; the main one is that it loses its aroma.

"The citrus fruits differ considerably here; for example, all citrus fruits grown south of Bangkok and also nearer the sea are far superior to those north of Bangkok. A matter of 8 miles or so makes a great difference. Those grown south of Bangkok are irrigated or inundated by very salty water, as the tide carries the salty ocean water up the Menam River and into the Klongs. When planting the *Nakon Chaisri* pummelo elsewhere the natives always add salt to the soil.

"North of Bangkok the river water is quite sweet. I tasted mandarins, choice fruits grown south of Bangkok, and fruits from stock which was derived from the southern garden but grown north of Bangkok, and the difference was tremendous. Those grown south of Bangkok sell for 6 ticals per hundred, and those grown north of Bangkok, although larger, sell for 3 ticals per hundred because the aroma is not comparable."

52389. "(From Bangkok, Siam.) *Thong Dee* pummelo. Seed presented by Doctor Yai, Minister of Agriculture. Doctor Yai considers this the best pummelo of Siam; it is a little acid and so is better liked than the *Nakon Chaisri*, which is very sweet; it is a splendid shipper and has quite the aroma of the *Nakon Chaisri*. The *Thong Dee* pummelo does not lose its flavor when planted elsewhere; it produces seeds and is also seedless at times."

52390. PTEROCARPUS MACROCARPUS Kurz. Fabaceæ.

"From Korat, Siam. The *mai padou*, one of the finest timber trees of Morat. It grows to a height of 150 feet with a girth of 10 feet at 4 feet above the ground. All the wood, or nearly all, is bought by Japan; it is very hard and splendidly adapted for furniture and also for construction work."

52391. QUERCUS TRUNCATA King. Fagaceæ. **Oak.**

"(No. 75. From Bangkok, Siam.) A valuable oak which grows on dry, shady, or gravelly slopes, at an altitude of 2,400 to 5,000 feet, and I should think that it would thrive in California and also in Florida. The acorns are very sweet and are eaten roasted. I have eaten many of them myself and they are rather good. The tree is a prolific bearer and seeds are plentiful just now."

52392. MALUS SYLVESTRIS Mill. Malaceæ. **Apple.**

(*Pyrus malus* L.)

From Kona, Hawaii. Scions presented by J. E. Gamalielson, weather observer, through Prof. W. H. Sherzer, Michigan State Normal College, Ypsilanti, Mich. Received March 29, 1921.

"A sport found by Mr. Gamalielson, about 15 years ago, growing on a fallen tree-fern log. He recognized the growing sprouts as being those of the apple, and he brought one to his home. It grew there for some time and bore fruit. From the original tree he transferred a sprout to his present home, and it has

been bearing ever since, some years so prolifically that the branches had to be propped to keep them from breaking off. The apple produced is a moderately good one and entirely without seeds. Apples do not grow very favorably in that climate. The elevation at Kona, Hawaii, is 500 feet; the precipitation about 127 inches, temperature averaging approximately 70° F." (*William A. Taylor.*)

52393 to 52397. QUERCUS spp. Fagaceæ. Oak.

From Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received January 20, 1921. Quoted notes by Mr. Rock.

"From Bangkok, Siam. Valuable oaks which grow on dry, shady, or gravelly slopes, at altitudes of 2,400 to 5,000 feet, and I should think that they would thrive in California and also in Florida. The acorns are very sweet and are eaten roasted. I have eaten many of them myself, and they are rather good. The trees are prolific bearers, and seeds are plentiful just now."

52393 and 52394. QUERCUS LINDLEYANA Wall.

52393. "No. 77a." **52394.** "No. 77b."

52395. QUERCUS POLYSTACHYA Wall.
"No. 78."

52396. QUERCUS SOOTEPENSIS Craib.
"No. 82."

52397. QUERCUS THOMSONI Miquel.
"No. 89."

52398. EUPHORBIA sp. Euphorbiaceæ.

From Meping River bluff, Fa Man, Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received February 1, 1921.

"*Mai khai.* A valuable shrub for use for binding sand on steep banks. It is exceedingly strong." (*Rock.*)

52399 to 52421.

From Honolulu, Hawaii. Seeds presented by Dr. Harold L. Lyon, in charge, department of botany and forestry, experiment station of the Hawaiian Sugar Planters' Association. Received January 31, 1921. Quoted notes by Dr. Lyon.

52399. CANARIUM RUFUM A. W. Benn. Balsameaceæ.

"Forwarded by the director of the Botanic Garden, Singapore."

A medium-sized tree with oblong coriaceous pinnæ 1 to 2 feet long. The flowers are fascicled on a terminal panicle. The drupes are 2 inches long. Native to Malakka. (Adapted from *Hooker, Flora of British India, vol. 1, p. 533.*)

52400. CANAVALI OBTUSIFOLIUM (Lam.) DC. Fabaceæ.

"Collected in Fiji by C. E. Pemberton."

A glabrous perennial creeper, widely distributed as a strand plant on tropical shores, with pinnately trifoliate leaves and few-seeded pods. According to Maiden, the brown oblong seeds are cooked and eaten by the Australian natives. The plant is useful as a binder of loose sand. (Adapted from *Contributions from the United States National Herbarium, vol. 9, p. 211.*)

For previous introduction, see S. P. I. No. 48600.

52399 to 52421—Continued.

52401. CASSIA GRANDIS L. f. Cæsalpiniaceæ.

"Forwarded by director of the Botanic Garden, Singapore."

A tree of medium size, native to the West Indies and Guiana, with a fairly stout stem; it branches irregularly and has a moderate spread. The large pinnate leaves are dark green. The pretty pink flowers are borne on innumerable short racemes along the bare branches, never or rarely among the foliage. The large, rough, hardwood pods, 16 to 18 inches long and 1¼ inches wide, almost round, are borne in great numbers; the numerous brown flattish, oblong seeds, rather small for the size of the pod, are each in a separate compartment wrapped in a thick gluelike substance. The beans are nondehiscent. Creoles are very fond of eating the substance in which the seeds are inclosed, although it has a very pungent odor. (Adapted from *Journal of the Board of Agriculture of British Guiana, vol. 12, p. 4.*)

For previous introduction, see S. P. I. No. 46140.

52402. CYCAS sp. Cycadaceæ.

"A cycad which grows here in dense groves; it is from 5 to 25 feet in height and resembles *Cycas revoluta.*"

52403. ELAEOCARPUS sp. Elæocarpaceæ.

"A fine tree with large glossy leaves."

52404 to 52410. FICUS spp. Moraceæ. **Fig.**

52404. FICUS sp.

"Collected in Fiji by C. E. Pemberton."

"A tree 20 to 40 feet tall." (*Pemberton.*)

52405. FICUS sp.

"Collected near Cairns, North Queensland, by J. A. Kusche."

"The only fig tree seen here, found growing in a salt-water slough near Cairns. The tree is about 100 feet tall, with no aerial roots, with compact dense foliage, and with a spread of about 100 to 150 feet. The dark-red fruit is the size of a walnut." (*Kusche.*)

52406. FICUS sp.

"Collected near Cairns, North Queensland, by J. A. Kusche."

"A large clean tree with fruit of a fine delicately sweet flavor and the size of a black Smyrna fig, only more rounded and dark crimson when ripe." (*Kusche.*)

52407. FICUS sp.

"Collected on Prince of Wales Island by J. A. Kusche."

"A large spreading tree." (*Kusche.*)

52408. FICUS sp.

"Collected on Prince of Wales Island by J. A. Kusche."

"One of the largest figs on the island; the fruit is orange-yellow." (*Kusche.*)

52409. FICUS sp.

"Collected on Prince of Wales Island by J. A. Kusche."

"Small-leaved fig; a large spreading tree." (*Kusche.*)

52410. FICUS sp.

"Collected on Prince of Wales Island by J. A. Kusche."

"A very large tree, white fruited." (*Kusche.*)

52399 to 52421—Continued.

52411. FLACOURTIA INDICA (Burm. f.) Merr. Flacourtiaceæ.
(*F. ramontchi* L'Hérit.) Ramontchi.

"Collected in Fiji by C. E. Pemberton."

"An introduced tree 30 feet tall, called 'Indian cherry,' a good ornamental with rich dark foliage." (*Pemberton.*)

For previous introduction, see S. P. I. No. 28289.

52412. MAXIMILIANEA VITIFOLIA (Willd.) Krug and Urb. Cochlospermaceæ.
(*Cochlospermum hibiscoides* Kunth.)

"Collected on Prince of Wales Island by J. A. Kusche."

"A tree from 10 to 50 feet tall with leaves like those of the maple; very showy when in bloom, with clusters of deep-yellow flowers the size of a dollar." (*Kusche.*)

52413. MIMUSOPS sp. Sapotaceæ.

"Collected on Prince of Wales Island by J. A. Kusche."

"Native plum. The fruit is eaten by the natives." (*Kusche.*)

52414. MUCUNA sp. Fabaceæ.

"Collected in Fiji by C. E. Pemberton."

52415. PARINARI sp. Rosaceæ.

"Collected on Prince of Wales Island by J. A. Kusche."

"One of the finest and largest trees on the island, 25 to 150 feet high, with very hard wood, and a spread of 150 to 200 feet. It grows everywhere on seashore and mountains. The tree is clean; no insects were noted." (*Kusche.*)

52416. STERCULIA sp. Sterculiaceæ.

"Collected on Prince of Wales Island by J. A. Kusche."

52417. ZIZIPHUS MAURITIANA Lam. Rhamnaceæ. Bor.

"Collected in Fiji by C. E. Pemberton."

"A small tree 15 feet in height, with an edible, apple-flavored yellowish green fruit 1 inch in diameter. Said to be from India." (*Pemberton.*)

For previous introduction, see S. P. I. No. 45625.

52418. (Undetermined.)

"Collected in Fiji by C. E. Pemberton."

"A tree 30 feet tall, native forest 'Lami.'" (*Pemberton.*)

52419. (Undetermined.)

"Collected in Fiji by C. E. Pemberton."

"A shrub." (*Pemberton.*)

52420. (Undetermined.)

"Collected on Prince of Wales Island by J. A. Kusche."

"A nice spreading small tree in the jungle, with long, dark, glossy leaves and hard wood." (*Kusche.*)

52421. (Undetermined.)

"Collected on Prince of Wales Island by J. A. Kusche."

"A small tree growing near the beach." (*Kusche.*)

52422 to 52424. DATURA METEL L. Solanaceæ. **Datura.**

From Goa, Portuguese India. Seeds presented by P. Correia Affonso. Received January 21, 1921.

52422. "A plant which has been used for centuries by the Hindus, Persians, Arabs, and other oriental peoples as a narcotic. In India, Datura doctors dispensed these seeds which are often used by thugs and other criminals to render their victims unconscious, dispensing it clandestinely with food or drink. Goa may be regarded as the type locality of this species. At least three different forms occur, chiefly distinguished from one another by the color of the stems and flowers, and also by the presence or absence of prickles on the capsules. All normal forms are characterized by 5-toothed trumpet-shaped corollas and globose, tuberculate, or spiny capsules which differ from those of our common *Datura stramonium* in being borne on inclined or nodding, instead of erect, peduncles and in not being regularly dehiscent." (*W. E. Safford.*)

For previous introduction, see S. P. I. No. 43774.

52423. This may possibly be a different color from S. P. I. No. 52422.

52424. Possibly a different form from the foregoing.

52425 and 52426. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

From Johannesburg, Transvaal. Seeds presented by the Agricultural Supply Association. Numbered January, 1921. Quoted notes by H. N. Vinall.

"The results of tests at Chillicothe, Tex., in 1921, indicated that these two lots were not equal either in yield or quality to the regular strains of Blackhull kafir. As forage they would be classed as medium, and the seed yield was about average. The plants grew to a height of 5½ feet, a little taller than our ordinary Blackhull kafir."

52425. "The plants of this lot had 13 leaves, being therefore slightly better than the No. 52426 for forage."

52426. "The plants of this lot had 11 leaves."

52427 to 52431. SACCHARUM OFFICINARUM L. Poaceæ.
Sugar cane.

From Florida. Seeds presented through Dr. E. W. Brandes, Pathologist, Office of Sugar-Plant Investigations, United States Department of Agriculture, Washington, D. C. Received January 29, 1921.

52427. *Christal*, from J. W. Ives, Kreamer Island, Fla. For experimental purposes.

52428. *D–74*, from J. A. McGee, Ritta Island, Fla. For experimental purposes.

"A sugar cane of medium size, early maturing, imported from Demerara by the Louisiana Sugar-Experiment Station, and now one of the most popular varieties in Louisiana for sugar manufacture." (*P. A. Yoder.*)

52429. *D–74*, from A. H. Price, South Bay, Fla. For experimental purposes.

52430. *D–74*, from H. A. Braddock, Tory Island, Fla. For experimental purposes.

52427 to 52431—Continued.

52431. *Florida Green*, from W. B. Cross, Kreamer Island, Fla. Introduced for experimental purposes.

"Presumably a medium-sized soft green cane identical with *Otaheite* of Cuba and *Bourbon* of the British West Indies. Variety low in fiber and highly susceptible to most sugar-cane diseases. Liked for a chewing cane but not well adapted for sirup or sugar because of the lack of disease resistance and poor ratooning qualities." (*P. A. Yoder.*)

52432 to 52435. SACCHARUM OFFICINARUM L. Poaceæ.

Sugar cane.

From Rio Piedras, Porto Rico. Seeds presented by F. S. Earle, Insular Experiment Station. Received January 15, 1921.

52432. "*D–109.* A dark-red cane, originated in Demerara by Doctor Harrison, fairly resistant to root disease and a fairly good ratooner. Its dark color might make it undesirable for sirup-making. When allowed sufficient time to mature, the cane tests well for sucrose and purity." (*H. B. Cowgill.*)

"A very good germinator." (*R. A. Vive.*)

52433. "*Kavangire* (Uba). A slender fibrous variety of the northern India (Japanese) type, very prolific and resistant to most diseases. Immune to mosaic disease. Similar to or identical with *Uba*." (*P. A. Yoder.*)

52434. "*P. R. 260.* An erect-growing, green to yellowish green cane, having long stalks of good girth, which gave excellent tonnage in *gran cultura* (long period of growth—18 months in Porto Rico) and also made an exceptionally fine appearance at Central Guanica, where it was sent for trial. The tonnage obtained from *gran cultura* was excellent. It has ratooned only fairly well and will probably be more suitable for the south coast, where ratooning is little practiced." (*H. B. Cowgill.*)

52435. "*P. R. 292.* A tall erect-growing cane, of reddish green color, which gave an excellent yield as *gran cultura*, and a juice of good sucrose and purity. The stalks were long and of good girth. It stooled well and was vigorous and healthy. It also made a good growth as ratoon cane." (*Annual Report of the Porto Rico Insular Experiment Station, 1917–1918, p. 91.*)

52436 to 52448.

From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received January 14, 1921. Quoted notes by Mr. Rock.

52436. CASTANEA DIVERSIFOLIA Kurz. Fagaceæ.

"(No. 81. Chiengmai, Siam.)"

A moderate-sized evergreen tree found in Nepal, eastern Bengal, Assam, and Chittagong up to an altitude of 5,000 feet. The fruit is eaten and much resembles the filbert in shape and flavor but has a thinner shell. The gray hardwood splits well and is largely used for shingles in Darjiling. It coppices freely and is often pollarded and the branches burned for fertilizer. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 2, p. 228.*)

52436 to 52448—Continued.

52437. ELAEOCARPUS SIAMENSIS Craib. Elæocarpaceæ.

"(No. 80. Chiengmai, Siam.) A fine ornamental foliage tree, producing seeds in great abundance. The seeds are used as a narcotic by the Lao. The tree will grow well in Florida."

A tree about 9 meters high, with densely puberulent young branches and reddish bark. The lanceolate papery leaves are 7 to 14 centimeters long and 2.6 to 6 centimeters wide. The white flowers are in racemes and have the petals, 5 millimeters long and 4 millimeters wide, fringed almost to the middle. The tree is found in an evergreen jungle on Dai Sutep at Chiengmai at an altitude of 660 meters. Lao name, *Mai Moon*. (Adapted from *Kew Bulletin of Miscellaneous Information, 1911, p. 23.*)

52438. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"A cotton with a large lint of khaki color. It grows four days' journey from Chiengmai. This cotton grows wild in the mountains and is now being cultivated in some villages owing to the demand for khaki cotton cloth. It is woven in a village called Lampoon. Many a soldier's uniform is made from this cotton. I have seen Siamese or Lao officials in brown-cotton uniforms."

52439. ORYZA SATIVA L. Poaceæ. **Rice.**

"(No. 94. Chiengmai, Siam.) Black rice, much liked as a breakfast food by the Europeans in Chiengmai. When boiled it is deep purple and has a very fine nutty flavor, quite unlike that of the ordinary rice. It is cultivated exactly like the other rice. The leaves, stalks, etc., are all black, and a field of black rice stands out plainly among the ordinary rice fields. I think that it can be developed as a breakfast food in the States."

52440 to 52448. QUERCUS spp. Fagaceæ. **Oak.**

52440 and 52441. QUERCUS JUNGHUHNII Miquel.

52440. "(No. 88. Chiengmai, Siam.) An oak with edible acorns greatly liked by the Lao people."

52441. "(No. 90. Chiengmai, Siam.) A variety of No. 88 [S. P. I. No. 52440]."

52442. QUERCUS sp.

"(No. 77. Chiengmai, Siam.)"

52443. QUERCUS POLYSTACHYA Wall.

"(No. 78. Chiengmai, Siam.)"

52444. QUERCUS FENESTRATA Roxb.

"(No. 79. Chiengmai, Siam.)"

52445 and 52446. QUERCUS THOMSONI Miquel.

52445. "(No. 86. Chiengmai, Siam.)"

52446. "(No. 89. Chiengmai, Siam.)"

52447. QUERCUS KERRII Craib.

"(No. 91. Chiengmai, Siam.)"

52448. QUERCUS sp.

"(No. 92. Chiengmai, Siam.)"

52449. ALEURITES MOLUCCANA (L.) Willd. Euphorbiaceæ.
(*A. triloba* Forst.) **Lumbang.**

From Mayaguez, Porto Rico. Seeds presented by D. W. May, in charge, Agricultural Experiment Station. Received February 10, 1921.

"Individuals here eat these nuts to some extent, but occasionally they are made quite ill from them, owing to the stage of ripeness of the nut or to some peculiar characteristic of the person that eats them. If they are eaten unripe, they act as a strong purgative; if fully mature and roasted, they are doubtless, in most cases, harmless. From the general experience in Porto Rico, however, I would advise eating them, if at all, with caution." (*May.*)

"Lumbang, or candlenut, oil is used in soap making, and in the Philippine Islands the press cake is highly prized as a fertilizer." (*R. A. Young.*)

52450. TELFAIRIA PEDATA (J. E. Smith) Hook. Cucurbitaceæ.

From Nairobi, Kenia, British East Africa. Seeds presented by S. W. Eells, American consul, through Dr. H. L. Shantz, Physiologist in Charge of Plant Physiological and Fermentation Investigations, Bureau of Plant Industry. Received January 13, 1921.

"A perennial climber, indigenous to eastern Africa, Zanzibar, and Pemba, which grows very luxuriantly and prolifically in this colony. The kernels of the seeds are used by the natives, both as a foodstuff and as a source of edible oil.

"The following analysis showing the percentage of the constituents of the seeds has been published by Gilbert (see Sadebeck, Die Kulturgewächse der Deutschen Kolonien und Ihre Erzeugnisse, Jena, 1899, p. 245): Moisture, 6.45; ash, 2.04; oil, 36.02; protein, 19.63; woody fiber, 7.30; nitrogen-free extractive matter, 28.45.

"These seeds are flat, irregularly circular in shape, and about 1¼ to 1½ inches in diameter. The single seeds average 4.9 grams in weight.

"The Imperial Institute reported as follows:

"'The seeds consist approximately of fibrous husk 11 per cent, shell 38 per cent, and kernel 51 per cent.'

"A previous investigator has recorded 7, 33, and 60 per cent of fibrous husk, shell, and kernel, respectively. The kernel yields 56.9 per cent of slightly reddish brown oil.

"The oil from seeds from Zanzibar gave the following analysis: Specific gravity at 15° C., 0.919; acid value, 2.6; saponification, 196; iodin value, 89.

"This is a nondrying oil and has a pleasant, slightly sweet taste. It would be suitable for soap manufacture, and also as an edible oil. The seed is used by Europeans in this colony both as a nut and as a flavoring for cakes.

"The reason that these seeds are not more used is due to the hardness of the shell and the difficulty of removing it, as well as to the intensely bitter, green skin which separates the kernel from the shell. If a method could be found of removing the tough fibrous husks and this bitter skin, it would appear that the seed would be of considerable commercial value, both for its edible oil and for the manufacture of soap, as well as for the resultant oil cake which would probably make a good cattle feed. It would be impossible, however, to use the cake after pressing the unhusked seeds on account of the skin mentioned above.

"A German syndicate of soap and candle manufacturers at Mannheim has investigated the possibilities of these seeds, but express the opinion that it would be inadvisable to place consignments of the seeds on the European market until a machine had been invented for rapidly and cheaply shelling them.

"These seeds grow very rapidly in any place which is not touched by frost. The pod containing the seeds is about a foot in diameter when ripe. The vine climbs over neighboring trees and requires no care." (*Eells.*)

52451 to 52460.

From Paris, France. Seeds presented by Vilmorin-Andrieux & Co. Received February 21, 1921.

52451 and 52452. CARAGANA spp. Fabaceæ.

52451. CARAGANA ARBORESCENS Lam. **Siberian pea tree.**

Variety *sophoraefolia.* A form of *Caragana arborescens* with extremely small leaflets. (Adapted from *Schneider, Illustriertes Handbuch der Laubholzkunde, vol. 2, p. 95.*)

52452. CARAGANA BOISI C. Schneid.

A vigorous species distinguished by its strong spines, the stipules lignified from the base of the rachis, and by its beautiful thick glabrous foliage which is notably persistent. (Adapted from *Vilmorin and Bois, Fruticetum Vilmorianum, Catalogue 1, p. 57.*)

52453 and 52454. BERBERIS spp. Berberidaceæ. **Barberry.**

52453. BERBERIS BRACHYPODA Maxim.

A bush from western China 4 to 7 feet high, with 3-parted spines, oval serrate leaves, yellow flowers in long slender panicles, and scarlet fruits which are up to half an inch in diameter. In its native country this barberry grows at altitudes of 5,200 to 11,700 feet. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 375,* and *Schneider, Illustriertes Handbuch der Laubholzkunde, vol. 2, p. 922.*)

For previous introduction, see S. P. I. No. 43818.

52454. BERBERIS AGGREGATA C. Schneid.

A shrub from thickets in the Min Valley, western Szechwan, at altitudes of 4,265 to 7,546 feet. It reaches a height of 5 feet and has yellowish brown spines in clusters of three. The oval-oblong leaves are rather small, with a few distant serrations. The yellow flowers, about one-fourth of an inch wide and almost sessile, are in dense racemes; the fruits are salmon red. (Adapted from *Bulletin l'Herbier Boissier, 2d ser., vol. 8, p. 203,* and from *Sargent, Plantae Wilsonianae, vol. 1, p. 375.*)

For previous introduction, see S. P. I. No. 43817.

52455. DEUTZIA sp. Hydrangeaceæ.

Apparently a new species of Deutzia.

52456 and 52457. PHILADELPHUS spp. Hydrangeaceæ.

52456. PHILADELPHUS GRANDIFLORUS Willd. **Common mock orange.**

A scentless species (though not entirely inodorous) far superior in its display of flowers to any of the fragrant sorts. It makes strong growth up to 10 feet or more in height. When pruned after flowering it makes straight, long shoots of 5 feet or more, which are covered with lovely white flowers along their whole length in the flowering season. The long branches are of great beauty and are in demand for cut-flower decorating, as well as for lawn display. This is a southern species, growing from Virginia southward, but it is quite hardy in the Middle States, and its merit as a hand-

52451 to 52460—Continued.

some, tall-growing shrub causes it to be extensively used for shrubbery plantings. (Adapted from *The Florists' Exchange, vol. 38, p. 15.*)

52457. PHILADELPHUS SERICANTHUS Kuehne. **Chinese mock orange.**

A bush 3 meters high, with inflorescences of 7 to 11 white flowers, native to thickets at altitudes of 1,300 meters in western Szechwan. The bark of 2-year-old twigs is nut brown or gray. The leaf blades are narrowly lanceolate, long-attenuate, with 3 to 8 or more small teeth or occasionally entire, smooth on both sides or with appressed hairs, or the underside densely white hairy on the veins. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 145,* and from *Gartenflora, vol. 45, p. 561.*)

52458. ROSA BEGGERIANA Schrenk. Rosaceæ. **Rose.**

A bush 1 to 2½ meters tall with evenly prickly, pinnate leaves, the leaflets usually 7 to 9, elliptic to oblong, smooth and deep green above, generally thickly hairy and bluish green below. The inflorescences are 1 to nearly 50 flowered and the flowers white, cream, or more rarely red. The fruits are very dark red. (Adapted from *Schneider, Illustriertes Handbuch der Laubholzkunde, vol. 2, p. 572.*)

52459. SPIRAEA MYRTILLOIDES Rehder. Rosaceæ. **Spirea.**

A graceful shrub 2 to 3 meters high and excessively spreading. The young branches are chestnut or fuscous brown and glabrous. The numerous short spurs, densely covered with the persistent fulvously pubescent bud scales and bases of the petioles, give to the 2 and 3 year old branches a peculiar appearance. The somewhat papery oval leaves are entire, cuneate at the base, glabrous and obscurely bluish green above, paler and laxly pilose beneath. The umbellate, hemispherical racemes are densely many flowered and are borne at the tips of short, few-leaved branches. The white flowers, 5 to 6 millimeters in diameter, are on graceful pedicels 3 to 6 meters long. Native to upland thickets at altitudes of 3,000 to 4,000 millimeters in western Szechwan. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 440.*)

52460. RHODODENDRON CHARTOPHYLLUM Franch. Ericaceæ.

An evergreen bushy species with white to lavender glabrous flowers, 3 to 4 centimeters long, broadly funnel formed and five lobed, on elongated flowering branches. The oblong or narrowly lanceolate leaves are rigidly coriaceous, glaucous above and sparsely scaly below. Native to Yunnan and extending from western Szechwan to Tatsienlur (Soulie). (Adapted from *The Garden, vol. 78, p. 304,* and from *Morot, Journal de Botanique, vol. 9, p. 398.*)

52461 to 52464. PYRUS spp. Malaceæ. **Pear.**

From Arlington Farm, Va. Seedlings of Asiatic hybrid pears. Numbered March, 1921. Quoted notes by J. Marion Shull, botanical artist, Office of Fruit-Disease Investigations, Bureau of Plant Industry.

"Oriental hybrid pear seedlings bred by Dr. M. B. Waite, Office of Fruit-Disease Investigations, United States Department of Agriculture, for blight resistance and grown at Arlington Farm."

52461 to 52464—Continued.

52461. PYRUS sp.

"A tree of medium size and vigor with light-brown bark and fairly upright branches. The light-green leaves are 2 inches long and 1 inch wide. The tree is apparently productive and is probably as blight resistant as the *Kieffer*. The large obovate to elliptic light-yellow fruit, 3¼ inches long and 3 inches in diameter, has a medium-thick, smooth, brown-dotted skin and juicy, crisp, mild-flavored flesh, granular but finer grained than that of the Angoulême. The fruit ripens September 15 to 30, and the dessert quality is good. The medium-stout stalk is 1 inch long and inserted in a slight cavity."

52462. PYRUS sp.

"A large vigorous tree with dark-brown bark, moderately spreading branches, and abundant foliage. The blight resistance is probably not equal to that of the *Kieffer;* the original tree is dead from blight at the roots and is now known only by top-worked trees and nursery stock. The smooth, thin-skinned yellow-russet fruit, 2 inches in diameter and of slightly irregular pyriform shape, ripens about September 10. The rich, juicy, medium fine-grained flesh is rather acid and of excellent dessert quality."

52463. PYRUS sp.

"A somewhat spreading tree of medium size and vigor, with only moderately abundant light-green leaves 2¼ inches long. The blight resistance is good. (No blight has been observed, and the tree is very vigorous in the nursery row.)

"The obovate to obconic fruit, 2 to 2¼ inches in diameter, of regular form, with a short stout stem inserted in a very slight depression, ripens September 1 to 10. The golden russet to red-brown rather smooth skin has numerous grayish dots. The flesh is of very good dessert quality and is melting, sirupy, and Seckellike."

52464. PYRUS sp.

"This large, vigorous, somewhat spreading tree with dark-brown bark is very blight resistant. (No blight observed.) The regular obovate fruit is 3¼ inches long and 3 inches in diameter, with a medium-long, rather slender stem inserted in a pronounced cavity. The medium-thin skin is yellow, tending to redden in the sun. The juicy tender flesh ripens about September 15 and is of good dessert quality. It is distinctly sweeter, juicier, tenderer, of better quality, and less stony than the Kieffer."

52465 and 52466.

From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received January 14, 1921.

52465. HYDNOCARPUS ANTHELMINTHICA Pierre. Flacourtiaceæ.

Maikrabao.

"(No. 83. Chiengmai, Siam.)" (*Rock.*)

For a full discussion of this species and its use in the treatment of leprosy, see United States Department of Agriculture Bulletin No. 1057, "The Chaulmoogra Tree and Some Related Species."

For previous introduction, see S. P. I. No. 48227.

52465 and 52466—Continued.

52466. LIVISTONA sp. Phœnicaceæ. Fan palm.

"(No. 85. Chiengmai, Siam.) This is in all probability a new species; it has large oval blue fruits, the flesh of which is eaten by the natives after it has been boiled. They sell three for 1 salung (.80.067)." (*Rock.*)

52467. CHAYOTA EDULIS Jacq. Cucurbitaceæ. Chayote.
(*Sechium edule* Swartz.)

From the city of Guatemala, Guatemala. Fruits and roots presented by Don Marcial Prem, through Dr. W. E. Safford, economic botanist, United States Department of Agriculture, Washington, D. C. Received January 26, 1921.

"The fruits of this variety are quite large (those received, 24 and 28 ounces, respectively), almost spherical, dark green, and practically free from corrugations, though there are small depressions at both the stem and blossom ends of the fruits. Broad ranks of thick, coarse spines extend from stem to fissure of the fruits, between which are narrow bands that are practically free from spines. The quality of the fruit is good, though this is not considered the best of the Guatemalan varieties." (*L. G. Hoover.*)

52468. HYDNOCARPUS ANTHELMINTHICA Pierre. Flacourtiaceæ.
Maikrabao.

From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received January 20, 1921.

"From Korat, Siam. The seeds furnish an oil used by the Chinese in the treatment of leprosy. I was told that the *maikrabao*, as this tree is called, grows plentifully along the rivers of Korat. No one at Korat, except the old natives, seemed to know anything about it. Finally I was taken out into the jungle, and there along some of the smaller tributaries to the main streams were Hydnocarpus trees in plenty. I photographed them in their native haunts. It would be well to plant those I sent along river banks or swampy places in Florida. Although they do well in cultivation, 1,000 feet is about the altitude at which they grow wild." (*Rock.*)

For an illustration of maikrabao trees, see Plate I.

52469 to 52489. SACCHARUM OFFICINARUM L. Poaceæ.
Sugar cane.

From Belmonte, Cienfuegos, Cuba. Seeds presented by Robert M. Grey, Harvard Experiment Station. Received February 4, 1921. Quoted notes by Mr. Grey.

"All numbers refer to Harvard seedlings."

52469. "*H 11.027.* Good for all situations; fine for milling; tolerates mosaic."

52470. "*H 11.050.* Robust grower of upright habit; tolerates mosaic."

52471. "*H 15.* A fine cane for hilly land; high in sucrose."

52472. "*H 144.* Resistant in old lands."

52473. "*H 219.* An improved Crystalline cane seedling."

52474. "*H 289.* Resistant against cane root disease; robust."

52469 to 52489—Continued.

52475. "*H 598.* Persistent cane for old land; resists mosaic."

52476. "*H 1418.* Heavy yield of cane; tenacious grower on low land."

52477. "Wild seedling from H 2038, naturalized; seed grows spontaneously along brooks."

52478. "*H 4121.* Heavy, upright, robust grower."

52479. "*H 4124.* Immune from mosaic; 90 per cent of the seedlings are resistant or immune. Seed held vitality over six months."

52480. "*H 6047.* Persistent grower on low land; high in carbohydrates."

52481. "*H 6112.* Resistant against mosaic; fine root tenacity."

52482. "*H 6113.* Resistant against mosaic; hardy; ratoons well."

52483. "*H 6241.* Tall, vigorous, upright; resistant against mosaic."

52484. "*H 6142.* Fine for general cultivation; high in sucrose."

52485. "*H 6286.* Tall, persistent-rooting variety; resistant against mosaic."

52486. "*H 6296.* Immune from mosaic, five years among mosaic plants; stands drought."

52487. "*H 9050.* A very robust grower, tolerant; not injured by mosaic."

52488. "*H 9092.* A very robust grower; tall, resistant; heavy tonnage."

52489. "*H 9176.* A robust grower on good land; high in carbohydrates; tolerant."

52490 and 52491. Rubus idaeus L. Rosaceæ.

European raspberry.

From Maidstone, England. Plants presented by George Bunyard & Co., Royal Nurseries. Received February 5, 1921.

52490. *Park Lane.* This is undoubtedly one of the sweetest fruits grown; it is fairly large, roundish, and well flavored; the clusters are moderately large. The fruit is too tender for market use but is unrivaled for garden culture. The stout vigorous canes, often reaching a height of 6 feet, are covered with slender, almost soft bristles. The leaves are large and broad with overlapping flat leaflets which are held out horizontally. This variety was grown by Mr. Pyne, of Topsham, Devon, and introduced in 1912. (Adapted from *Journal of Pomology, vol. 1, p. 243.*)

52491. *Pyne's Royal.* This raspberry has fully satisfied the hopes that it evoked in 1913 when it was introduced and is now the largest of all varieties grown. Its size, however, has not detracted from its cropping powers, and it will, we imagine, be grown largely for market when it becomes more plentiful. The rich-red firm fruits, often 4 inches in circumference, are rather conical, of moderate sweetness, and often occur in clusters of twenty. The stout canes bear scattered dark thorns and large, rugose, down-curved leaves. This variety was grown by Mr. Pyne, of Topsham, Devon, in 1907, and introduced in 1913. (Adapted from *Journal of Pomology, vol. 1, p. 243.*)



AN AVENUE OF THE SIAMESE MAIKRABAO TREES, WHICH PRODUCE AN OIL VERY SIMILAR TO THAT OF THE CHAULMOOGRA TREE. (HYDNOCARPUS ANTHELMINTHICA PIERRE, S. P. I. No. 52468.)

Seeds from the trees shown here were forwarded to Washington under S. P. I. No. 51773, and later, under S. P. I. No. 52468, more seeds, collected from trees near Korat in eastern Siam, were sent in. The oil from these trees is very similar to the true chaulmoogra oil and is used in the same way in the treatment of leprosy. (Photographed by J. F. Rock, Klong Sarn, Bangkok, Siam, October, 1920; P22628FS.)



THE TOCTE, A NATIVE ECUADORIAN WALNUT TREE. (JUGLANS SP., S. P. I. No. 52611.)

This tree strongly resembles our native black walnut (*Juglans nigra*), but the foliage is perhaps larger. The nuts are 1½ inches in diameter, and the kernel has a mild pleasant flavor. The wood is said to be fine grained and to take a beautiful finish. (Photographed by Wilson Popenoe, Ambato, Ecuador, January, 1921; P18327FS.)

52492. ANANAS SATIVUS Schult. f. Bromeliaceæ. **Pineapple.**

From Bahia, Brazil. Shoots presented by Dr. V. A. Argollo Ferrão. Received February 5, 1921.

"*Abacaxi.* Cultivated on the south of Bahia on a peculiar sandy soil, good only for that crop. They come to market on sailing vessels." (*Argollo Ferrão.*)

Previous introductions of *abacaxi* are apparently more or less resistant to the wilt disease, which has proved very destructive to this crop.

52493 and 52494.

From Bangkok, Siam. Collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received February 9, 1921. Quoted notes by Mr. Rock.

52493. IPOMOEA CARNEA Jacq. Convolvulaceæ. **Morning-glory.**

"Cuttings of a large woody, scandent or rambling shrub, which can be grown over trellis work and is one of the largest flowered and handsomest species I know. It is covered with pink flowers all the year round and is easily grown from cuttings."

52494. IRVINGIA MALAYANA Oliver. Simaroubaceæ.

"The seeds are very rich in fat, and an oil is extracted from them; they are also eaten roasted and remind one of butternuts. The seeds are sold on the market."

A tree native to Malaleka, with thick elliptic leaves 4 inches long and small flowers in axillary racemes. The large fruit is drupaceous. (Adapted from *Hooker, Flora of British India, vol. 1, p. 522.*)

52495. ADONIS VERNALIS L. Ranunculaceæ.

From Groningen, Netherlands. Seeds presented by A. Fiet, director, Botanic Garden. Received January 5, 1921.

The best and most commonly cultivated Adonis and a desirable and very effective early bloomer.

For previous introduction, see S. P. I. No. 51762.

52496 and 52497.

From Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received February 10, 1921.

52496. FICUS GLOMERATA Roxb. Moraceæ. **Fig.**

"*Madua.* A large Ficus which grows on the banks of the Meping River. The edible fruits are red when ripe, a little smaller than the Smyrna fig, and are borne on the trunk and branches in great numbers." (*Rock.*)

For previous introduction, see S. P. I. No. 12111.

52497. MOMORDICA COCHINCHINENSIS (Lour.) Spreng. Cucurbitaceæ.

"A large climber which grows along the banks of the Meping River. The large orange-colored spiny fruits are edible before maturity." (*Rock*).

For previous introduction, see S. P. I. No. 34692.

52498 to 52502. Triticum aestivum L. Poaceæ. Common wheat.

(*T. vulgare* Vill.)

From Cambridge, England. Seeds presented by Prof. H. R. Biffen, Department of Agriculture, Cambridge University. Received February 11, 1921. Quoted notes by Prof. Biffen.

"Pure lines of *Yeoman* wheat which, I believe, are better in quality than the ordinary stocks in cultivation here, because the total nitrogen content is distinctly higher than that of ordinary stocks."

For previous introduction, see S. P. I. No. 46797.

52498. "*Yeoman C.*"
52499. "*Yeoman F.*"
52500. "*Yeoman H.*"
52501. "*Yeoman S.*"
52502. "*Yeoman Y.*"

52503. Triticum turgidum L. Poaceæ. Poulard wheat.

From Haifa, Syria. Seeds presented by Dr. A. Khazanoff, Jewish Colonization Association. Received February 11, 1921.

"Wheat of the *Hati* variety, which I secured from the Jewish colony of Yabniel in the district of Tiberias, Lower Galilee, Syria. This is the principal variety grown there and in the neighboring valleys. It does very well in the hot dry climate which characterizes that region, and may be of service in your hot and arid Southwest." (*Khazanoff.*)

52504 and 52505.

From Santa Cruz de la Sierra, Santa Cruz, Bolivia. Seeds presented by Herman Meschurtz. Received February 14, 1921.

52504. Piptadenia cebil Griseb. Mimosaceæ.

"*Currebau-sevil*, which we are using for tanning, and by the use of which I tanned a bull hide in three months. The tree grows in the poorest soil, also in stiff clay, and needs little water; it may be very useful in the Southern States." (*Meschurtz.*)

For previous introduction, see S. P. I. No. 48074.

52505. Prosopis sp. Mimosaceæ.

"*Cuperi algaroba.* A handsome shade tree which grows rapidly, yields fine wood for furniture, and bears large pods, 12 inches long and three-fourths of an inch in diameter, of which all live stock are fond." (*Meschurtz.*)

52506. Quercus ilex L. Fagaceæ. Oak.

From Thrace, Turkey. Seeds presented by Stephen R. Capps, United States Geological Survey, through T. H. Kearney, United States Department of Agriculture. Received February 19, 1921.

"An evergreen live oak, desirable as an ornamental and hedge plant, with a hollylike, usually crinkly leaf, ranging in shade in different individuals from yellow-green to dark green. The leaves are very dense, so that the bush looks solid, and about like holly leaves in that they are prickly enough to discourage animals and children but not spiny enough to be really objectionable. The tough gnarled stems are very strong, and the smooth mottled gray bark is about like holly bark.

"The plant takes kindly to pruning, as witnessed by those bushes growing along trails where sheep and goats have kept them trimmed back. It is hardy

in a climate much like that of Washington, D. C., and is unaffected by temperatures of 0° to 110° F. These seeds were collected in Thrace, near the base of the Gallipoli Peninsula, where the plant is very common; it has a vertical range from sea level to 3,000 feet, the highest mountains in the district where it is found. The tree is adapted to a wide variety of soils, growing vigorously in beach sand, lowland silts, residual sandy and clayey soils, and on rocky surfaces with little soil.

"The bush grows to a height of 6 to 10 feet. I saw one individual, probably of the same species, that had a trunk 8 inches in diameter and was 20 feet high.

"To get the acorns before the crows and magpies beat me to them, I had to pick them before they fell naturally." (*Capps.*)

For previous introduction, see S. P. I. No. 30389.

52507. DIOSCOREA ALATA L. Dioscoreaceæ. **Yam.**

From Crescent City, Fla. Presented by H. D. Collette, who grew it from material from the West Indies supplied by Samuel Rosen, New York City. Received February 24, 1921.

"Cuttings of a yam with yellowish flesh, somewhat moist, but of good quality for preparing mashed yam." (*R. A. Young.*)

52508. RAPHANUS SATIVUS L. Brassicaceæ. **Radish.**

From Tientsin, Shantung, China. Seeds presented by Mr. K'ung, through H. S. Conard, Grinnell, Iowa. Received February 24, 1921.

"*Lo-pu.* A very 'sweet' radish from Tientsin, Shantung, China." (*K'ung.*)

52509. ERIOGONUM WRIGHTII SUBSCAPOSUM S. Wats. Polygonaceæ.

From Ness, Neston, England. Seeds presented by A. K. Bulley. Received February 24, 1921.

A low perennial found in the high montane belt of southern California. The leafy branches are short, forming a close, dense mat, from which arise the short flowering stems. The bright-pink flowers are clustered near the ends of the stems and form a sharp contrast to the mat of small white woolly leaves. (Adapted from *Jepson, A Flora of California, pt. 4, p. 415.*)

52510 to 52513.

From Bangkok, Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received February 17, 1921. Quoted notes by Mr. Rock.

52510. DIOSPYROS MOLLIS Griffith. Diospyraceæ.

"One of the most valuable dye plants in Siam. The Chinese import yearly 3,000,000 ticals ($804,000) worth of silk, pay the duty on it, and all for the purpose of dyeing the silk black; every bit is again exported. There are large but rather primitive dye factories here. It is said that the Chinese have tried to grow the tree in China but were not successful. I have seen material dyed black which had been washed twice a week for three years and it certainly was still as black as black could be. The dyeing is said to be a laborious process. The fruit must be still green when collected for dyeing purposes; it is mashed in water and the material is dipped into it, the water is then thrown away, and the pulp is pressed and placed again in water; this process is repeated many times. The material must be dried in the sun after each dipping. It is difficult to secure ripe seeds, as the fruits are col-

52510 to 52513—Continued.

lected before maturity. The tree is about 25 feet high, with fruits the size of a large cherry."

52511. INGA LAURINA (Swartz) Willd. Mimosaceæ.

"A small ornamental tree native to South America, which is cultivated in Singapore."

A tropical American tree, 9 to 15 meters high, with leaves composed usually of four leaflets; the flower clusters are longer than in other members of this genus. As a shade tree for coffee this species is second in importance only to the "guava" (*Inga vera*). Specimens have been found, in some cases at least, with tubercles on the roots. The tree is one of those employed in the cacao cultivation of Guadeloupe in making hedges or windbreaks which are planted across the direction of the prevailing winds at distances of 100 meters. (Adapted from *Cook and Collins, Economic Plants of Porto Rico, Contributions from the U. S. National Herbarium, vol. 8, p. 167.*)

52512. LAGERSTROEMIA sp. Lythraceæ.

"A small tree with exceedingly ornamental flowers which are very large and purplish pink. It is found in the dry jungle of Korat."

52513. SINDORA sp. Cæsalpiniaceæ.

"A tree growing in the dry jungle of Morat, eastern Siam. It is quite ornamental, and the pods are spineless."

52514. HYDNOCARPUS CASTANEA Hook. f. and Thoms. Flacourtiaceæ.

From Moulmein, Burma. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received February 21, 1921. Quoted notes by Mr. Rock.

"A large tree 50 to 80 feet in height with smooth light-brown bark and fruits the size of a large orange, ripening from March to July. Only one tree among thousands was found with ripe fruits on January 7, 1921. It was loaded with ripe and semiripe fruits. The tree grows on steep rocky hills along watercourses near the Karen village of Oktada, several miles from Paung, in the Martaban Hills, on the Kalama Mountain Range. The trees must be planted in gravelly, well-drained soil.

"Strange to say, the people in Moulmein know nothing about this tree, and the superintendent of the leper asylum here did not know that the tree grows at all in Burma. The foresters I met in the jungle never heard of the name *kalaw*, which is the Burmese name of the tree. Many of the Burmese I interrogated knew the name but not the tree; they knew the seeds from the bazaars where they are sold. Only people actually making a living by collecting these seeds can give information."

For a full discussion of this tree, see "The Chaulmoogra Tree and Some Related Species," United States Department of Agriculture Bulletin No. 1057.

52515 to 52529.

From Groningen, Netherlands. Presented by C. Broekema, director, Groninger Zaaizaadvereeniging. Received February 2, 1921. Quoted notes by Mr. Broekema.

52515 and 52516. AVENA SATIVA L. Poaceæ. **Oats.**

52515. Seeds of a form of oats with a light husk.

52516. Seeds of a form of oats with dark husk.

52515 to 52529—Continued.

52517 to 52519. HORDEUM VULGARE PALLIDUM Seringe. Poaceæ. **Barley.**

52517. "Seeds of *Bocumer gerst* (winter barley)."

52518. "Seeds of *Winter gerst*."

52519. *Mansholt wintergerst II.* Seeds of the first, second, and "after" crop. It is shorter and stiffer than *Mansholt wintergerst I;* however, it is susceptible to rust. Of high weight per hectoliter. (Adapted from *Autumn (Aug., 1919) Catalogue, Groninger Zaaizaadvereeniging.*)

52520 to 52522. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

52520. "Tubers of a form which has been extensively experimented with here and proved one of the best to be found."

52521. "Tubers of a form which has been extensively experimented with here and which has proved one of the best."

52522. "Tubers of a potato under extensive experimentation here which has proved one of the best."

52523 to 52529. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.** (*T. vulgare* Vill.)

"Varieties of winter wheat which surpass all those which are known in this country and which in my opinion deserve to be tested in every region where winter wheat is cultivated."

52523. *Addens*, seeds of the original, especially developed for light soils by N. G. Addens, at Bellingwolde. Trials on the better sand and peat soils are to be recommended. The cold resistance of this wheat is very good; the yield is about 40 hectoliters per hectare; the straw is of medium length and fairly stiff; and the head is not heavy. This variety is developed from the so-called *Belgian wheat* and received from this a high value for baking. (Adapted from *Autumn Catalogue (Aug., 1919), Groninger Zaaizaadvereeniging.*)

52524. *Diekhuis I.* Seeds of the "after crop." The straw is long and stiff, and the grain red; the cold resistance is somewhat better than that of Wilhelmina; and the yield is good. It is more and more in demand for those soils which are not so well adapted for the growing of wheat. (Adapted from *Autumn Catalogue (Aug., 1919), Groninger Zaaizaadvereeniging.*)

52525. *Millioen III.* Seeds of the original and "after" crop. The variety is leafy with a large white grain. In yield and cold resistance it compares with Wilhelmina. (Adapted from *Autumn Catalogue (Aug., 1919), Groninger Zaaizaadvereeniging.*)

52526. "*Pantso.*"

52527. "*Wieb.*"

52528. "*W. & E. P.*"

52529. "*W. & W. D. 14.*"

52530 and 52531.

From Jocolo, Izabal, Guatemala. Seeds presented by Harry Johnson. Received February 18, 1921. Quoted notes by Mr. Johnson.

52530. BYRSONIMA CRASSIFOLIA (L.) H. B. K. Malpighiaceæ. **Nance.**

"A variety of the common nance, called here *nance agrio*, to distinguish it from the ordinary sweet variety which it much resembles in the tree

52530 and 52531—Continued.

and fruit. The fruits are pleasantly acid and do not seem to have quite so strong an odor as that of the sweet one. Both the sweet and sour varieties are made into a preserve. The fruits are packed in jars with a layer of sugar, then a layer of fruit, etc., afterwards some aguardiente (an inferior brandy) is added. This recipe has ceased to be of interest in the north. However, I can assure you it is good."

For previous introduction, see S. P. I. No. 43429.

52531. CROTALARIA STRIATA Schrank. Fabaceæ.

"Locally called *chipilín*. It is an ornamental perennial species reaching about 6 feet in height and spread. The spikes of pea-shaped yellow flowers and the young leaves are boiled with rice or meat and are very good. The plant is also good for forage."

For previous introduction, see S. P. I. No. 50751.

52532. XANTHOSOMA sp. Araceæ. **Yautia.**

From Guatemala. Presented by Harry Johnson. Received March 17, 1921.

"Corms of the *malanga colorado*. The leafstalks are slightly reddish along the groove. It is a good variety around Jocolo." (*Johnson.*)

"This yautia is pink skinned and pink and white fleshed. It is mealy when cooked and of good flavor. The leaf stems are plain green, with slightly reddish or purplish shading near the margin of the sinus wings. The blade forms about a 95° angle with the petiole." (*R. A. Young.*)

52533. CASTANOPSIS ARGENTEA (Blume) A. DC. Fagaceæ.

From Buitenzorg, Java. Seeds presented by the director of the Botanic Garden. Received February 16, 1921.

An evergreen tree 50 to 60 feet high, with thinly coriaceous, lanceolate leaves, shining above and sometimes quite silvery beneath. Native to Tenasserim and Martaban. (Adapted from *Hooker, Flora of British India, vol. 5, p. 621.*)

52534. TAMARIX APHYLLA (L.) Karst. Tamaricaceæ. **Athel.**
(*T. articulata* Vahl.)

From Indio, Calif. Cuttings presented by Bruce Drummond, Government Date Gardens. Received February 15, 1921.

A bush or often a small tree 10 to 50 feet high, native to India, with pink flowers one-eighth of an inch in diameter, in slender spikes more or less interrupted. The branches are fastigiate, elongated, and slender, and the leaves are reduced to a very short sheath, with a minute tooth. (Adapted from *Nicholson, Illustrated Dictionary of Gardening, vol. 4, p. 7, 1889.*)

For previous introduction, see S. P. I. No. 45952.

52535 to 52545. SACCHARUM OFFICINARUM L. Poaceæ.
Sugar cane.

From Soledad, Cienfuegos, Cuba. Seed presented by Robert M. Grey. Received February 4, 1921. Quoted notes by Mr. Grey.

"H refers to Harvard seedlings."

52535. "*H 4124.* Resistant against mosaic; 90 per cent of the progeny are exempt. The seed held vitality from January to July."

52536. "*H 6241.* Harvard seedling; parent immune from mosaic."

52535 to 52545—Continued.

52537. "*H 6296.* Harvard seedling; parent immune from mosaic."

52538 to 52545. "These are resistant or tolerant, are robust growing, and suitable for cultivation on our old lands."

52538. "*H 10.028.*"

52539. "*Java 51.*"

52540. "*H 1304.*"

52541. "*H 1418.*"

52542. "*H 1419.*"

52543. "*H 4121.* A heavy Javan seedling from *J 247*; resistant against mosaic."

52544. "*H 9029.*"

52545. "*H 9092.*"

52546 to 52556. TRITICUM spp. Poaceæ.

From Maison Carree, Algiers. Seeds presented by Prof. L. Ducellier, L'École d'Agriculture. Received February 26, 1921. Quoted notes from Ducellier, Les Blés du Sahara, except as indicated.

"The Sahara wheats appear to be perfectly adapted to the Saharan regions; the heads and seeds are normally developed. The numerous related forms which are in the oases seem to indicate an ancient culture. The heads are remarkably well filled, each measure of grain sown yields 10 to 100 measure, and in certain cases, considering the climatic conditions, the yield is comparable with the best wheats of Europe. It does not seem that the ordinary varieties of wheat, even those with a great yield, can become under the best conditions as floriferous as certain Saharan varieties. This peculiar property of the Saharan wheats makes them interesting objects of hybridization."

52546 to 52552. TRITICUM SPELTA L. **Spelt.**

52546. "*Abdessalem.* From Taghouzi, Province of Gourara; a white beardless wheat, distinguished from European wheat by its shorter and more compact head."

52547 and 52548. "*Bhamoud.* From Khenessa de l'Augrout, Gourara. This grain is of excellent quality."

52547. "With red grain."

52548. "With white grain."

52549. "*El Harcha.* From Gourara. Also grown in the Province of Tesbit (Timmimoun)."

52550. "*Ali ben Maklouf*, or *Ali*, or *Maklouf.* From Gourara."

52551. "*Lebbaga.* From Gourara."

52552. "*Masraf.* From Gourara. A white bearded wheat which can not be completely husked by hand on account of its firm glumes."

These seeds were received as *Triticum spelta* var. *saharae.*

52553 to 52556. TRITICUM AESTIVUM L. **Common wheat.**
(*T. vulgare* Vill.)

52553. "*Bahtane.* From Gourara. It has also been grown in the oasis of Timmi, Touat."

52554. "*Baroudi.* From the oasis of Timmi, Touat."

52555. "*El Moumena.* From Gourara."

52556. "*Ferek*, or beardless *Hamra.* From Gourara. Also grown in the oasis of Timmi, Touat."

These wheats were received as *Triticum vulgare* var. *oasicolum.*

52557 to 52565. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.**

(*T. vulgare* Vill.)

From Cowra, New South Wales. Seeds presented by J. T. Pridham, plant breeder, Experimental Farm, through J. A. Clark, agronomist, in charge of Western Wheat Investigations, United States Department of Agriculture. Received March 1, 1921. Quoted notes by Mr. Pridham, except as otherwise noted.

"Pure-line selections of *Hard Federation* wheat." (*Clark.*)

An early spring wheat, short, with strong white straw and erect dense awnless spikes with small hard vitreous white kernels which are very attractive and doubtless would attract buyers and bring a premium over other white wheats on American markets, as is the case in Australia. The plant has the distinctive brown, hard, and general appearance of *Federation* in the field, but differs in being slightly taller and earlier, in having a square and shorter spike, broader and squarer shoulders, and shorter, rounder, and harder kernels. The variety *Hard Federation* has been grown commercially in Australia since 1914. During the past few years it has replaced the Federation variety in many sections because of equal yields and better milling quality of the grain. (Adapted from *Australian Wheat Varieties in the Pacific Coast Area, United States Department of Agriculture Bulletin No. 877, p. 11.*)

52557. "Wheat No. 24 (A8)."
52558. "Wheat No. 30 (A8)."
52559. "Wheat No. 55 (A7)."
52560. "Wheat No. 64 (A6)."
52561. "Wheat No. 66 (A6)."
52562. "Wheat No. 69 (A6)."
52563. "Wheat No. 71 (A6)."
52564. "Wheat No. 71 (A9)."
52565. "Wheat No. 73 (A9)."

52566. ARUNDO PLINII Turra. Poaceæ.

(*A. mauritanica* Desf.)

From Algiers, Algeria. Rhizomes presented by Dr. L. Trabut. Received February 28, 1921.

This grass is smaller in all parts than *Arundo donax:* the culms are mostly 1.5 meters tall and 4 to 7 millimeters thick; the blades, 1 to 2 centimeters wide, are smooth or scabrous on the margins only. The brown or yellow panicle is rather narrow and reaches 30 centimeters in length. Native to the Mediterranean region. (Adapted from *Ascherson and Graebner, Synopsis der Mitteleuropäischen Flora, vol. 2, p. 334.*)

52567. PYRUS COMMUNIS × LINDLEYI. Malaceæ. **Pear.**

From Fruitland Park, Fla. Cuttings presented by Louis Bosanquet. Received February 11, 1921.

"*Cincinis* pear." (*Bosanquet.*)

A variety which resembles the *Sha Lea* pear very closely. It is the parent of numerous seedlings fruited by S. F. Smith. The medium to small fruit is of fairly regular oval form, with slightly roughened skin, light colored with numerous brown dots. The flesh is of yellowish white color with little flavor but juicy. The texture is crisp and breaking; and the core is large and gritty with large flattish black seeds. (Adapted from *Report of the Agricultural Experiment Station, Ithaca, N. Y., Bulletin No. 332, p. 479.*)

52568. PYRUS USSURIENSIS Maxim. Malaceæ. **Pear.**

From Yokohama, Japan. Seeds purchased from the Yokohama Nursery Co. Received February 28, 1921.

A Chinese pear stock recently discovered by Prof. F. C. Reimer, of the Southern Oregon Experiment Station, to be the most resistant to the blight which attacks and destroys the trees. (Adapted from *Yokohama Nursery Co., Descriptive Catalogue for 1920, p. 55.*)

For previous introduction, see S. P. I. No. 44051.

52569. EUGENIA UNIFLORA L. Myrtaceæ. **Pitanga.**

From Porto Alegre, Rio Grande do Sul, Brazil. Seeds presented by G. S. Froes. Received January 12, 1921.

The pitanga is the best of the Eugenias. It is grown to some extent in Florida and California, but it has not been given the attention it deserves. No horticultural varieties have been established, since the tree is rarely propagated vegetatively, although there is considerable variation among seedlings.

For previous introduction, see S. P. I. No. 37026.

52570. TAIWANIA CRYPTOMERIOIDES Hayata. Pinaceæ.

From Jamaica Plain, Mass. Plants presented by Prof. C. S. Sargent, director, Arnold Arboretum. Received March 1, 1921. Collected originally by E. H. Wilson.

The loftiest tree in the forests of Taiwan is the Taiwania, which rears its small moplike crown well above all its neighbors. The average height of this tree is from 150 to 180 feet, but specimens exceeding 200 feet are known. The trunk is sometimes as much as 30 feet in girth, quite straight, and bare of branches for 100 to 150 feet. It is a strikingly distinct tree, singularly like an old Cryptomeria; both trees suggest gigantic lycopods. In the dense forests the crown is small, dome shaped or flattened, the branches few and short, and one wonders how so little leafage can support so large a tree. When the top is broken by storms, the lateral branches assume an erect position. In the more open forest the branches are massive and wide spreading, the crown is oval or flattened, and on small trees the branchlets are often pendent. The Taiwania sheds its small branchlets as do Cryptomeria, Cunninghamia, and Sequoia. (Adapted from *Journal of the Arnold Arboretum, vol. 2, p. 35.*)

For previous introduction, see S. P. I. No. 46980.

52571 to 52573.

From Kulara, via Cairns, Queensland. Seeds presented by J. A. Hamilton. Received February 24, 1921. Quoted notes by Mr. Hamilton.

52571. MUSA sp. Musaceæ. **Banana.**

"Wild banana."

52572. PIPER sp. Piperaceæ. **Pepper.**

"Wild pepper seeds. A very ornamental vine with very good fruits; it likes rich alluvial soil and plenty of moisture in the growing season. Of course it will not stand much frost, but as it is uninjured by the few frosty nights here the plant should thrive in southern California."

Received as *P. bancroftii*, for which a place of publication has not yet been found.

52573. (Undetermined.)

"A pretty tree which grows in alluvial soil near creeks; it bears prolifically very acid fruits which make a good preserve."

52574 to 52580.

From Ambato, Ecuador. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received February 4, 1921. Quoted notes by Mr. Popenoe.

52574. CARICA sp. Papayaceæ. **Babaco.**

"(No. 533a. Ambato, Ecuador. January 3, 1921.) Seeds of a rather dwarf species 8 to 10 feet in height, which can probably be grown in the open in southern California. The fruits are about a foot long and nearly seedless; from 17 good specimens only 10 seeds were obtained, and it is rare to find specimens which contain more than 3 seeds. The fruit is like a slender papaya in form and appearance, but has highly aromatic flesh containing much papain. It is not good for eating until cooked, when it yields an excellent sauce with plenty of 'character.' The local name for this fruit is *babaco* and the plant is commonly propagated by cuttings. For cultivation in southern California and for hybridizing with the common papaya, I believe it to be a fruit of genuine merit."

52575. DURANTA TRIACANTHA Juss. Verbenaceæ.

"(No. 536a. Ambato, Ecuador.) *Chivo.* A common indigenous shrub in ravines and on hillsides about Ambato, growing to a height of 15 feet and heavily armed with stiff sharp thorns, for which reason it ought to make an excellent hedge plant. Its pale-blue flowers, borne in clusters 3 or 4 inches long, are followed by golden berries half an inch in diameter. The plant should be sufficiently hardy for cultivation in California and Florida."

52576. FRAGARIA CHILOENSIS (L.) Duchesne. Rosaceæ.
Chilean strawberry.

"(No. 534. Ambato, Ecuador. December 29, 1920.) *Ambato* strawberry. That this plant has been cultivated at Ambato since a remote day is evidenced by the following passage, taken from Velasco, Historia del Reino de Quito, 1789: 'The strawberry of Quito, erroneously called *frutilla* (little fruit), since it is as large as two or three European strawberries. It bears every day in the year, and although it is common in several provinces, in no other is it produced in such abundance and perfection as in that of Tungurahua.'

"This remarkable fruit more recently attracted the attention of Robert Spruce, the English naturalist, who wrote (according to the Florist and Pomologist, Jan., 1870, p. 24): 'In the equatorial Andes the Province of Ambato is famed for its strawberries, which equal in size and flavor some of our best varieties and are to be seen exposed for sale in the market place of Ambato every day in the year. They are cultivated at an altitude of from 7,000 to 9,500 feet above the sea, where the mean temperature of the year ranges between 59° and 67° F.; but the best are grown a little way out of Ambato, as you go toward Guayaquil, on the slopes of Guachi (lat. 1¼° S.) at near 9,000 feet, and in a mean temperature of 60° F.; where, however, the thermometer does sometimes descend, perhaps half a dozen times in the year, to the freezing point in the early morning and scarcely ever on two successive days.'

"It is only in the region of Guachi that this species is commercially cultivated in Ecuador. Distant about 5 miles from Ambato, it lies at an altitude varying from 9,500 to 10,000 feet, and consists of a series of rolling hills, almost devoid of trees and with a soil which can be char-

52574 to 52580—Continued.

acterized as a very loose fine sandy loam of volcanic origin. The strawberry plantations cover an area of at least 60 acres; the plants are never irrigated, and the rainfall is probably not more than 15 inches per annum. Three times a year the fields are cleaned of weeds with a heavy hoe, this being the only cultural attention which they receive. The plants do not grow to a large size. The natives assert that the plants when irrigated make luxuriant growth but do not yield abundantly, nor is the fruit large and sweet, and this has, indeed, been observed by me to be the case when plants are grown in the town of Ambato under good cultural conditions. The fruit is harvested once a week throughout the year; there are, however, three seasons when the most abundant yield is obtained, these being in February, August, and December. The method of handling the fruit is primitive; it is carried to Ambato in kerosene boxes and is there sorted and packed in baskets for shipment by train to Guayaquil and Quito.

"In form this strawberry is less variable than most of the varieties grown in the United States. It is oblong-conical, sometimes oblong-ovoid, and from 1 to 2 inches long. When fully ripe it is light red in color, with the flesh pinkish white, meaty, juicy, and of mild, sweet flavor. The quality is not so good as that of the finest North American and European strawberries, but the fruit can be shipped much more successfuly because of its firm texture.

"This is one of the most remarkable and interesting fruits of Ecuador. It deserves careful attention at the hands of North American strawberry breeders and should be tested particularly in the dry Southwestern States. I would recommend for it a light, loose, sandy soil and very little water."

52577. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

"(No. 532a. Ambato, Ecuador. January 2, 1921.) A small tomato from the market of Ambato, Ecuador. The fruits are round, smooth, of attractive color and good quality. Of interest in connection with tomato breeding in the United States."

52578. PRUNUS ARMENIACA L. Amygdalaceæ. **Apricot.**

"(No. 537a. Ambato, Ecuador.) This fruit is cultivated commercially in two sections of Ecuador, at Ambato and in the vicinity of Cuenca. Regarding its behavior in the latter region, Luis Cordero (Enumeración Botánica) says: 'This handsome fruit tree succeeds perfectly in our haciendas of rather warm climate, especially in the fertile and beautiful valleys of Paute and Gualaceo. Rare is the year in which the fruit is not abundant, and for this reason the well-known boxes of apricots preserved in sirup, so highly esteemed in other parts of the country, are never wanting.' Outside the Cuenca and Ambato regions, occasional trees are to be seen at Loja and northward in Imbabura Province.

"The ripening season at Ambato is in January and February. Propagation is commonly by seed and occasionally by grafting on the peach, apricot, and plum. The varieties grown in Ecuador (seedling forms in the main) are almost invariably small fruited and considerably inferior to the best North American and European sorts.

"For trial in the United States as a stock plant."

52574 to 52580—Continued.

52579. PRUNUS SEROTINA Ehrh. Amygdalaceæ. Capulin.

"(No. 538a. Ambato, Ecuador.) *Capulin.* Seeds from ordinary fruits, to be grown for trial as stock plants on which to graft superior varieties of this and other rosaceous fruits.

"Theodor Wolf ["Ecuador," published at Leipzig, 1892] says, 'The *capulin* is as distinguishing a characteristic of the Sierra as the cocoanut is of the coast. I do not doubt that it is indigenous, but commonly it is found in cultivation about the huts of the Indians, and in their fields and orchards.' The distribution of this species in the interandean region of Ecuador is widespread, but it is seen in much greater abundance in some regions than in others. Beginning in the northern part of the country, it is frequent in the Provinces of Carchi and Imbabura, but not particularly so in the former. Around the Lake of San Pablo it grows in great abundance. In Pichincha Province it is only fairly common. From Latacunga to Riobamba it is one of the few trees which grows upon the cold, sandy plains, and it here attains greater economic importance, perhaps, than in any other part of the country. In the Azuay it is almost as abundant and important, however, and in certain portions of this Province, together with that of Canar, it has the appearance of an indigenous species. In Loja it is not rare, but not sufficiently abundant to play a very important part in the list of economic products. Its range in general is from 6,000 to 11,000 feet.

"The historian Gonzalez Suarez recounts that the *capulin* tree was worshipped by the inhabitants of Canar Province in pre-Columbian times; and it is found in a wild, though not certainly indigenous, condition at the present time. It is a curious though not unique circumstance that it should be known throughout the country, even among the Indians who speak Quichua, under a name taken from the Aztec tongue. I have nowhere been able to find any other name than that of *capulin;* and in certain places the latter has been combined with Quichua words to make compound names such as *capulin-urcu* (the name of a certain mountain), and *sacha-capulin* (the name given to a species of Vallea thought to resemble the *capulin* in appearance).

"This plant, which is cultivated from Peru northward to Mexico, becomes a stout tree up to 40 or 45 feet in height. The leaves are oblong-lanceolate to lanceolate, finely serrate, and 3 to 5 inches long. The flowers, which are produced on slender racemes 3 to 8 inches long, are white and about three-quarters of an inch broad. The fruits resemble a European cherry in appearance; they are oblate or nearly round, from one-half to three-quarters of an inch in diameter, deep purplish maroon in color when fully ripe, with a thin, tender skin surrounding greenish flesh and a single hard seed. The flavor and quality of the fruit, as also the size, vary greatly; as commonly seen, the capulin is not over half an inch in diameter, and its flavor is disagreeably bitter. In several regions, however, there are very superior forms, well worthy of vegetative propagation. Some of the best ones are those of Cuenca and Ambato. At Catiglata, near the latter town, there is a famous tree whose fruit is large, very juicy, and as sweet as the best European cherries."

52574 to 52580—Continued.

52580. PRUNUS CERASIFERA MYROBALANA (L.) C. Schneid. Amygdalaceæ.
Plum.

"(No. 535a. Ambato, Ecuador.) *Mirabel.* This plum was brought from Europe in the early colonial days and is quite successful under the conditions which obtain in the region of Ambato (8,500 feet), the trees growing to large size and producing their popular fruits in great abundance. Propagation is by suckers, less commonly by seed, and occasionally by cuttings. The species is often used as a stock plant on which to graft the so-called *Reina Claudia* plum (properly *Chabot* or *Bailey*). The fruits ripen earlier than those of other plums now cultivated at Ambato, the season being from December to January; they are round to broadly oval in form, up to an inch long, bright red when fully ripe, with soft juicy flesh of pleasant flavor, much inferior in quality, however, to that of good northern varieties such as the *Bailey* and *Wickson Perfection*, both of which are now grown commercially at Ambato. For trial in the United States as a stock plant."

52581 to 52583.

From Beira, Mozambique. Seeds presented by Thomas Honey, acting Director of Agriculture, Governo do Territorio da Companhia de Mozambique. Received March 3, 1921. Quoted notes by Mr. Honey.

52581 and 52582. ANACARDIUM OCCIDENTALE L. Anacardiaceæ.
Cashew.

52581. "Large red-fruited variety."

52582. "Large yellow-fruited variety."

52583. LANDOLPHIA KIRKII Dyer. Apocynaceæ.

"Indigenous rubber vine."

A scandent shrub native to the Nile Land and Mozambique, with thinly coriaceous leaves, very variable in size and shape on the same branch, lanceolate to oblong, 1 to 4 inches long. The whitish flowers, 1½ inches long, are in many-flowered corymbs or in somewhat loose panicles, ovoid or much elongated, with spreading branches often passing into tendrils. The ovoid-globose fruits are 1 to 3 inches in diameter. This is one of the most important rubber plants of East Africa. (Adapted from *Thiselton-Dyer, Flora of Tropical Africa, vol. 4, sec. 1, p. 55.*)

For previous introduction, see S. P. I. No. 5023.

52584 and 52585. DATURA INNOXIA Mill. Solanaceæ.

From Teneriffe, Canary Islands. Seeds presented by Frank Anderson Henry, American consul. Received March 3, 1921.

"This species, indigenous in Mexico and tropical America, was introduced into the Canary Islands, southern Europe, and India at a very early day. It has been confused by many writers with the Old World *Datura metel*, but is easily distinguished from that species by the 10-angled limb of its corolla and the soft pubescence of its foliage and young branches. It was figured by Sims, in Curtis's Botanical Magazine, pl. 1440, in 1812, under the incorrect name *D. metel* and published by him in De Candolle's *Prodromus*. This species is identical with the *nacazcul*, or downy *toloatzin* of the Aztecs, who used it as a

narcotic and in certain religious ceremonies. It has recently been cultivated on the island of Montserrat, British West Indies, as a source of scopolamin, an alkaloid with the properties of *atropin*." (*W. E. Safford.*)

52584. Received as *D. stramonium*, but does not agree with that species.

52585. Received as *D. fastuosa alba*, but does not agree wtih that species.

Obtained from Sr. Don Rodolfo Godinez, ingeniero director de la Granja Agrícola.

52586 to 52594.

From Santiago, Chile. Seeds presented by F. Albert, consulting forester, Forestry Department, through the United States Forest Service. Received March 5, 1921.

52586. AEXTOXICON PUNCTATUM Ruiz and Pav. Euphorbiaceæ. **Tique.**

A Chilean tree belonging to the spurge family, with small colorless scales covering all of its parts, and with dense foliage. The leaves, quite stiff and narrowly oblong in shape, are very dark green on the upper surfaces and light green or even whitish below. The small white flowers are borne in short axillary racemes, and the fruits are small black olive-shaped drupes. By reason of its beauty the wood is admirably suited for the making of furniture, etc. (Adapted from *Castillo and Dey, Jeografía Vejetal del Río Valdivia, p. 68.*)

For previous introduction, see S. P. I. No. 49268.

52587. CAESALPINIA PECTINATA Cav. Cæsalpiniaceæ. **Tara.**
(*C. tinctoria* Domb.)

A tall upright spiny shrub or small tree, often planted for hedges in Peru. Here it grows under much the same conditions as the *molle*, or *pepper tree*, but extending into somewhat lower and drier situations. In the market of Lima *tara* pods are a regular article of trade, and are said to be used for dyeing, tanning leather, and making ink. The immature seeds of the *tara* contain underneath the skin a layer of edible flesh. It has a rather pleasant, slightly sweetish taste, like the arillus of the seeds of Inga and other leguminous trees. (Adapted from *O. F. Cook, note to S. P. I. No. 41323.*)

52588. CALDCLUVIA PANICULATA (Cav.) D. Don. Cunoniaceæ. **Tiaca.**

La Tiaca, also called *triaca* by the natives of Chile. The tree may reach a height of 15 meters. The leaves, up to 14 centimeters long, are elliptic, serrate, short stemmed, and frequently opposite. The white aromatic flowers which appear in spring are borne in axillary corymbs. The wood is excellent for carriage making. (Adapted from *Castillo and Dey, Jeografía Vejetal del Río Valdivia, p. 57*, and from *Johnson, Gardener's Dictionary, p. 155.*)

52589. EUCRYPHIA CORDIFOLIA Cav. Eucryphiaceæ. **Muermo.**

An ornamental and also useful Chilean tree which attains a height of about 15 feet, with thick, leathery, shining leaves and aromatic white flowers which appear in the spring and make the tree a beautiful sight. Because of the abundance of nectar, this tree is a favorite with the bees. The bark, rich in tannin, is utilized in dyeing and also in medicine. (Adapted from *Castillo and Dey, Jeografía Vejetal del Río Valdivia, p. 81.*)

For previous introduction, see S. P. I. No. 49270.

52586 to 52594—Continued.

52590. LAURELIA SEMPERVIRENS (Ruiz and Pav.) Tulasne. Monimiaceæ. (*L. aromatica* Juss.) **Chilean laurel.**

"A handsome tree of southern Chile, with durable wood, which is never bored by insects and is much used for flooring. An excellent tree for our northwest coast." (*W. E. Safford.*)

For previous introduction, see S. P. I. No. 49272.

52591. MAYTENUS BOARIA Molina. Celastraceæ. Maiten.

"An ornamental Chilean tree of weeping habit, with small gray-green and orange fruits. Superficially it resembles the pepper tree (*Schinus molle*). It thrives well as far north as San Francisco and should be exploited as a shade tree for dry regions. The young branches are much relished by cattle." (*Fairchild.*)

52592 to 52594. NOTHOFAGUS spp. Fagaceæ.

52592. NOTHOFAGUS DOMBEYI (Mirb.) Oerst. Coigüe. (*Fagus dombeyi* Mirb.)

A majestic tree, with leathery, oval, or elliptic short-stemmed leaves which are of an intense shining-green color. It is native to Chile, where it will grow in soil too damp for cultivation. The wood is quite valuable for building purposes. (Adapted from *Castillo and Dey, Jeografía Vejetal del Río Valdivia, p. 39.*)

For previous introduction, see S. P. I. No. 49274.

52593. NOTHOFAGUS OBLIQUA (Mirb.) Blume. **Roble.** (*Fagus obliqua* Mirb.)

A tall deciduous tree, with oval-oblong clear-green leaves and 3-seeded fruits. The wood, which is considered a valuable timber, varies in quality with the nature of the soil. The streets of the city of Valdivia are paved with blocks of wood of this tree. It is said to be the most northerly of the Chilean beeches. (Adapted from *Castillo and Dey, Jeografía Vejetal del Río Valdivia, p. 35.*)

For previous introduction, see S. P. I. No. 49275.

52594. NOTHOFAGUS PROCERA Oerst. **Rauli.** (*Fagus procera* Poepp. and Endl.)

A deciduous Chilean timber tree, once abundant in the province of Valdivia, but now comparatively scarce owing to the great demand for its wood which is reddish and compact, and is used for parquet flooring, cabinetwork, etc. (Adapted from *Castillo and Dey, Jeografía Vejetal del Río Valdivia, p. 36.*)

52595. CALOPHYLLUM INOPHYLLUM L. Clusiaceæ. **Alexandrian laurel.**

From Manila, Philippine Islands. Seeds presented by Adn. Hernandez, director, Manila Bureau of Agriculture. Received February 26, 1921.

This tropical tree is widely distributed throughout India, where a greenish oil is extracted from the seeds and is used for burning by the poorer classes. It is also used as an application in rheumatism.

An analysis of Queensland-grown fruits follows: Shells, 62.5 per cent; kernels, 37.5 per cent; greenish yellow oil, 43 per cent; dry residue, 27 per cent; moisture, 30 per cent; ashes of whole kernels, 1.66 per cent; ashes of exhausted residue, 6.15 per cent. The green oil on saponification yields a

bright-yellow soap, the green pigment of the oil having been changed into a bright yellow. This oil is bitter and aromatic; its specific gravity is 0.942; and it solidifies at +5°.

The strong, durable reddish wood is useful for the joiner and cabinetmaker; in India it is used for masts, spars, railway sleepers, machinery, etc. The weight is 63 pounds per cubic foot. (Adapted from *Maiden, Useful Native Plants of Australia, pp. 284, 390.*)

For previous introduction, see S. P. I. No. 38118.

52596 and 52597.

From Santiago, Chile. Seeds presented by F. Albert, consulting forester, Forestry Department, through the United States Forest Service. Received March 5, 1921.

52596. PHILESIA MAGELLANICA Gmel. Liliaceæ.

A shrub 3 to 4 feet high, bearing pendulous bright-red flowers. It is native to South America from Chile to the Straits of Magellan. It is said to be remarkably strong in withstanding the effects of a deleterious atmosphere, for it grows well in the noxious fumes of the copper-smelting works in Chile. It is hardy in favored districts of Britain south of the Thames. It requires a light peaty soil. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 55, p. 398.*)

For previous introduction, see S. P. I. No. 31744.

52597. TRICONDYLUS OBLIQUA (Ruiz and Pav.) Kuntze. Proteaceæ.
(*Lomatia obliqua* R. Br.) **Radal.**

An evergreen tree up to 35 feet in height, with somewhat grooved branches, alternate leathery leaves with shining upper surfaces, and axillary racemes of white flowers. The leaves are fragrant, reminding one of the European walnut; an infusion of the bark has purgative properties utilized in medicine. Native to Chile. (Adapted from *Castillo and Dey, Jeografía Vejetal del Río Valdivia, p. 41.*)

For previous introduction, see S. P. I. No. 49278.

52598. FICUS CARICA L. Moraceæ. **Fig.**

From Palermo, Italy. Cuttings purchased through Louis G. Dreyfus, jr., American consul. Received March 8, 1921.

Cuttings of a fig growing in the orchard of Agostino Lamonica, Casteldaceia Italia, Palermo, about 12 miles from the city of Palermo. The fruit is said to be the size of a saucer.

52599. CASSIA OCCIDENTALIS L. Cæsalpiniaceæ.

From Bahia, Brazil. Seeds presented by H. M. Curran. Received March 11, 1921.

"Seeds of this plant, ground after washing, make a fair coffee substitute which is in common use among the poor people of South American countries from Colombia to Brazil. The plant is a rapid-growing coarse annual weed, bearing great quantities of seed." (*Curran.*)

52600. SORBUS TRILOBATA (Labill.) Heynh. Malaceæ.
(*Pyrus trilobata* DC.)

From Paris, France. Cuttings presented by Prof. Georges Poirault, Université de Paris, École Supérieure de Pharmacie. Received March 11, 1921.

"Cuttings of a tree growing at the Villa Thuret (but originally from Syria), which is a rather rare but very interesting ornamental, being covered in the spring with large white flowers, and in the autumn maturing fruits which make excellent preserves. A Syrian friend of mine tells me that in his country this tree is very popular." (*Poirault.*)

52601. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Prague, Bohemia. Seeds presented by Grunhut & Fanta. Received March 17, 1921.

Bohemian red clover introduced for experimental purposes.

52602. BRASSICA OLERACEA BOTRYTIS L. Brassicaceæ. **Cauliflower.**

From Lugano, Switzerland. Seeds presented by F. Dammann, seed specialist. Received March 11, 1921.

"Cauliflower *Primus*, the finest Italian cauliflower, introduced by my firm to the trade in 1897. *Primus* is grown by market gardeners in almost every European country." (*Dammann.*)

52603. RHODODENDRON RACEMOSUM Franch. Ericaceæ.

From Kew, England. Seeds presented by Sir David Prain, director, Royal Botanic Gardens. Received February 24, 1921.

"A very desirable species discovered by Delavay in Yunnan, China, at an altitude of about 9,000 feet. It has small pink sweet-scented flowers which are produced when the plants are still small enough to be handled in pots. It is said to be perfectly hardy in England." (*F. V. Coville.*)

52604. AMYGDALUS DAVIDIANA (Carr.) Zabel. Amygdalaceæ.
(*Prunus davidiana* Franch.)

From Nanking, Kiangsu, China. Seeds purchased through J. H. Reisner, from the College of Agriculture and Forestry, University of Nanking. Received March 3, 1921.

Introduced for experimental purposes.

52605. POPULUS ALBA SUBINTEGERRIMA Lange. Salicaceæ. **Poplar.**

From Algiers, Algeria. Cuttings presented by Dr. L. Trabut. Received March 9, 1921.

A tree native to Lower California, which grows to a height of 80 or 90 feet, with a stout trunk 3 feet through, covered with rough ash-colored bark, and with ascending branches. The silky pubescent and ovate leaves are 3 inches long. The tree grows on the high mountains of the interior of the Cape region of Lower California, and along streams which it often follows well down toward the warm lowlands. The leaves and flowers appear in February; in October all are fallen, an unusual condition in Lower California where most of the vegetation comes forward with the summer and fall rains. The light reddish wood of this tree is used for making furniture. The wood much resembles cherry in color, is close grained, moderately hard, and shows a handsome satiny surface. It appears well suited for the interior finish of houses or for the better classes of cabinetwork. It is therefore desirable that this tree should be tested for timber in countries with a temperate climate. Since it grows at a considerable elevation above the sea, where the temperature sometimes falls below the freezing point, the tree might be expected to thrive in Southern California and in all the Mediterranean basin. (Adapted from *Garden and Forest, vol. 4, p. 330.*)

52606. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

From Johannesburg, Transvaal, Union of South Africa. Seeds presented by J. Burtt Davy, Agricultural Supply Association. Received March 11, 1921.

White kafir introduced for comparison with American-grown seeds.

52607 to 52617.

From Ambato, Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received March 11, 1921. Quoted notes by Mr. Popenoe.

52607. DATURA SANGUINEA Ruiz and Pav. Solanaceæ.

"(No. 570b. Ambato, Ecuador. January 14, 1921.) Two seed pods from the common red-flowered arborescent Datura cultivated in the vicinity of Ambato, altitude about 8,500 feet."

52608 and 52609. DELOSTOMA ROSEUM (Karst. and Tr.) Schum. Bignoniaceæ.

52608. "(No. 566a. Quinta Normal, Ambato. January 22, 1921.) *Cholán.* A small tree, native to certain regions of Ecuador and occasionally cultivated in parks and gardens. It is rather susceptible to frost, but will probably withstand the winters of southern California and southern Florida. Its lilac-colored flowers resemble those of the catalpa in form and size."

52609. "(No. 567a. Quinta Normal, Ambato. January 22, 1921.) *Cholán.* This plant differs from 566a (S. P. I. No. 52608), principally in the color of the flowers, which are pale lilac. It also seems to be a trifle less frost resistant than the latter. For trial in California and Florida."

52610. DURANTA TRIACANTHA Juss. Verbenaceæ.

"(No. 562a. Ambato, Ecuador. January 22, 1921.) *Chivo.*"

For previous introduction, see S. P. I. No. 52575.

52611. JUGLANS sp. Juglandaceæ. **Walnut.**

"(No. 571a. Quito, Ecuador. January 29, 1921.) *Tocte.* There are probably two species of Juglans in Ecuador which go under this name; one of them is *Juglans peruviana*, the other as yet undescribed. Both are found in the highlands between altitudes of 6,000 and 10,000 feet; one or the other is abundant in nearly every town of the sierra. The tree is sometimes called *nogal*, as well as *tocte;* the fruit is always known by the latter name.

"Luis Cordero (Enumeración Botánica) says of this tree in the Province of Azuay, 'It is most useful, since it furnishes, aside from its grateful fruit and its fine, solid, and beautiful wood, a tonic of probable efficiency obtained from boiling the leaves.' The plant is much used by the Indians of Imbabura Province in the preparation of dyes.

"The *tocte* is abundant at Ambato. It can scarcely be termed a cultivated species in this region, since it is not commonly planted; but trees which spring up around cultivated fields and in dooryards are allowed to grow unmolested, and the fruit is utilized in a small way. The plant strongly resembles *J. nigra*, but the foliage is perhaps larger. The nuts are an inch and a half in diameter, with a very thick bony shell deeply

52607 to 52617—Continued.

corrugated on the surface, and a kernel of mild, pleasant flavor. Recently the species has been utilized in Ambato as a stock plant on which to graft *J. regia.*

"In Ibarra the *tocte* is very abundant, and the nuts are commonly sold in the market. They are used to prepare a famous sweetmeat, the nogada of Ibarra, made from brown or white sugar, milk, and walnut meats. At Otavalo the tree is quite abundant, as also in the southern part of Ecuador at Loja and Cuenca. The two species which go under this name are very similar in character."

For an illustration of the tocte, see Plate II.

52612. MEDICAGO SATIVA L. Fabaceæ. **Alfalfa.**

"(No. 563a. Ambato, Ecuador. January 21, 1921.) Seed purchased in the market of Ambato, near which town it was produced, at an altitude of 8,600 feet. This is the common alfalfa of the Ecuadorian highlands, forwarded for trial in comparison with North American varieties. It is cultivated in a region of little rainfall and on a very light, loose sandy soil."

52613. TACSONIA TRIPARTITA Juss. Passifloraceæ.

"(No. 561a. Ambato, Ecuador. January 24, 1921.) *Tacso.* This species is quite distinct in habit from *Tacsonia mollissima;* the plant is a slender climber, reaching to 15 or 20 feet. The leaves are deeply 3-lobed, with the lobes narrow; the flowers are light pink, 3 inches broad. The fruits are oblong, tapering slightly toward the stem, about 3 inches in length, and orange-yellow. In flavor they are quite similar to those of *T. mollissima.* For trial in California and Florida."

52614. PRUNUS SEROTINA Ehrh. Amygdalaceæ. **Capulin.**

"(No. 564a. Ambato, Ecuador. January 24, 1921.) *Capulí.* Seeds of the large-fruited variety of which scions have been sent."

For previous introduction, see S. P. I. No. 52579.

52615. PRUNUS CERASIFERA MYROBALANA (L.) C. Schneid. Amygdalaceæ. **Plum.**

"(No. 565a. Ambato, Ecuador. January 22, 1921.) *Mirabel.* Seeds obtained from fruits purchased in the market of Ambato. For trial as a stock plant."

For previous introduction, see S. P. I. No. 52580.

52616. ZEA MAYS L. Poaceæ. **Corn.**

"(No. 560a. Ambato, Ecuador. January 12, 1921.) *Maiz negro* (black corn). A peculiar variety of corn, obtained in the market of Ambato. The ears are 3 to 6 inches long, tapering toward the apex, and the kernels large, starchy, and purplish black."

52617. ASTRAGALUS sp. Fabaceæ.

"(No. 568a. Ambato, Ecuador. January 22, 1921.) An attractive shrub common on dry hillsides about Ambato (8,500 feet), whence this seed. It sometimes reaches to 6 feet in height; its compound pinnate leaves are 3 to 5 inches long, and its lilac-purple pea-shaped flowers, borne in small clusters, are about half an inch broad. The plant will probably succeed in California and Florida, where it should be tested as an ornamental."

52618. HORDEUM DISTICHON PALMELLA Harlan. Poaceæ. **Barley.**

From Ayr, Scotland. Seeds presented by McGill & Smith (Ltd.). Received March 11, 1921.

"Sample of a new barley for which our name is *Golden Pheasant*. It is a cross between the best brewing barley in Britain and the best brewing barley in Germany." (*J. F. McGill.*)

52619. ACACIA TORTILIS (Forsk.) Hayne. Mimosaceæ.

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received March 21, 1921.

A tree abundant in many parts of tropical Africa and Arabia, with brown or reddish brown extremities and straight spines 2.5 centimeters long on the barren branches and very short, slightly recurved spines on the flowering branches. The linear-oblong leaflets are 2 to 7 millimeters long. The capitate flowers are in clusters of as many as five in the leaf axils. The flat, spirally twisted linear pod is 6 to 12 centimeters long. (Adapted from *Muschler, Manual Flora of Egypt, vol. 1, p. 461.*)

52620. CARICA PAPAYA L. Papayaceæ. **Papaya.**

From Honolulu, Hawaii. Seeds presented by J. M. Westgate, Agronomist in Charge, Agricultural Experiment Station. Received March 21, 1921.

"This variety of papaya which has been under cultivation through four generations has transmitted its characteristic flavor and texture and, to a reasonable degree, its shape to all of the seedlings of its kind that have come under observation. To this variety has been given the name *Solo*. The fruits are quite small, in many instances being only large enough for one serving. Most plants of the variety are hermaphrodite or bisexual, but a staminate tree is found occasionally. Although the fruits are small, they are crowded into the axil of nearly all the leaves and are so numerous that the yield is reasonably heavy, yet not equaling in total weight that of some of the large kinds. The fruit is pyriform, somewhat irregular, colors well and uniformly before softening, and is free from the diseased spots which occur on the surface and penetrate the pulp of many of the large forms. The flesh is of medium thickness, of bright-yellow color, smooth, tender almost to melting, and of delicious flavor even near the stem end, where many papayas lack flavor. The seeds, which are abundant, permit ready and rapid means of propagation, and, because of the loose placenta or inner lining of the fruit to which the seeds are attached, they are very easily removed when the fruit is prepared for serving. From the standpoint of the home gardener, the *Solo* is considered one of the best of the papayas that have been grown at the experiment station, for, although small, its qualities of texture and flavor give it first rank." (*Report of the Hawaii Agricultural Experiment Station, 1919, p. 28.*)

52621. RHODODENDRON RACEMOSUM Franch. Ericaceæ.

From Edinburgh, Scotland. Seeds presented by Dr. Isaac Bailey Balfour, director, Royal Botanic Gardens. Received March 19, 1921

"The amount of pink color in the flower of this species varies enormously. We have them from pure white to forms which are pink throughout. It resembles in that respect your *Rhododendron vaseyi*." (*Balfour.*)

52622 to 52661.

From Elstree, Herts, England. Plants presented by Hon. Vicary Gibbs. Received March 7, 1921. Quoted notes by Mr. Gibbs.

52622. ABIES FAXONIANA Rehd. and Wils. Pinaceæ. **Fir.**

A tree 20 to 40 meters high, with obscurely gray fissured bark and horizontal branches; the common species in northwest Szechwan, where it forms extensive forests. The tree is characterized by the short, broadly ovoid scales of its very resinous winter buds, its ferruginous villose shoots, rather short flat leaves, and by its violet-purple, oblong, densely resinous cones, 6 to 7 centimeters long. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 42.*)

52623. ABIES SIBIRICA NEPHROLEPIS Trautv. Pinaceæ. **Fir.**

A variety which differs from *Abies sibirica* in its kidney-shaped scales that are almost three times as broad as long and somewhat exceed the bracts. Native to Amur, Siberia. (Adapted from *Maximowicz, Primitiae Florae Amurensis, p. 260.*)

For description of *A. sibirica*, see S. P. I. No. 42311.

52624. ABIES RECURVATA Masters. Pinaceæ. **Fir.**

A very remarkable species, unlike any other in its strongly decurved but assurgent leaves. It is a very local species forming entire forests in the Min Valley south of Sungpan. The tree reaches a height of 80 feet and has reddish brown bark. The leaves are deep green or very glaucous, varying very much in this respect. The small erect brown cones are borne in clusters at the ends of the branches and near the tops of the trees. The timber is hard, resinous, and highly valued for building purposes. (Adapted from *Journal of the Linnean Society, vol. 37, p. 423.*)

52625. AESCULUS INDICA (Royle) Hook. Æsculaceæ.

A tree 100 feet high, found at altitudes of 8,000 to 10,000 feet in northern India, and flowering the latter part of June when the other horse-chestnuts have finished. The luxuriant foliage is shining green; and the dainty white flowers, which are borne in fairly dense racemes, have the two small upper petals heavily blotched with yellow changing to orange-red and the lower petals tinged with pink. (Adapted from *The Garden, vol. 76, p. 376*, and from *Gardening Illustrated, vol. 39, p. 405.*)

52626. BERBERIS sp. Berberidaceæ. **Barberry.**

"*Wisley seedlings.*"

52627. BERBERIS sp. Berberidaceæ. **Barberry.**

"*Forrest No. 13208.*"

52628. BERBERIS sp. Berberidaceæ. **Barberry.**

"*Forrest No. 13224.*"

52629. CARAGANA BOISI C. Schneid. Fabaceæ.

A variety with beautiful persistent foliage.

For further description, see S. P. I. No. 52452.

52630. CLEMATIS MONTANA RUBENS Wilson. Ranunculaceæ.

A splendid spring-flowering climber which will grow almost anywhere. It is perfectly hardy and a very free grower, ascending 15 feet in one season. The profuse flowers are 2 to 3 inches across and soft rosy red. (Adapted from *Gauntlett, Hardy Plants Worth Growing, No. 92, p. 22.*)

52622 to 52661—Continued.

52631. CLEMATIS TANGUTICA (Maxim.) Korsh. Ranunculaceæ.

A superb species 10 to 16 feet high, closely related to *Clematis orientalis*, with foliage equally glaucous, flowering in July with large bright-yellow, very abundant flowers with long-pointed petals. The fruit forms silvery plumelike, very decorative tassels. (Adapted from *Vilmorin-Andrieux, Plantes Vivace et a Massifs, 1921, p. 29.*)

52632 to 52639. COTONEASTER spp. Malaceæ.

52632. "*Farrer 403.*"
52633. "*Forrest 33.*"
52634. "*Forrest 5567.*"
52635. "*Forrest A553.*"
52636. "*Forrest 14864.*"
52637. "*Forrest 14948.*"
52638. "*Forrest 14976.*"
52639. "*Forrest 16031.*"

52640. DEUTZIA SCHNEIDERIANA LAXIFLORA Rehder. Hydrangeaceæ.

A shrub 1 to 2 meters high with fuscous-purple branches and somewhat papery, elliptic, stellately hairy leaves, shining or white beneath. The flower clusters are broadly paniculate, 3 to 6 centimeters long. The oblong petals are about 10 millimeters long, stellately hairy on the outer surface. The stamens, often longer than the petals, are dilated and toothed at the tip, the teeth scarcely touching the anther. The three graceful styles are about as long as the stamens. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 7.*)

For previous introduction, see S. P. I. No. 40580.

52641. DEUTZIA sp. Hydrangeaceæ.

"*Forrest No. 15631.*"

52642. DEUTZIA sp. Hydrangeaceæ.

"*Farrer No. 109.*"

52643. FORSYTHIA sp. Oleaceæ.

"Sport."

52644. ILEX FARGESII Franch. Aquifoliaceæ.

A glabrous species with black bark and thick, spreading leaves 10 to 15 centimeters long, linear-lanceolate or narrowly oblong, the lower entire and the upper remotely denticulate. The flowers are crowded in globose cymes on pedicels 5 to 6 millimeters long, and the spreading petals are 5 millimeters long. The globose drupes are in clusters of three to four in the axils of the leaves. Native to Szechwan, western China. (Adapted from *Journal de Botanique, vol. 12, p. 255.*)

52645 and 52646. LAVANDULA SPICA L. Menthaceæ. **Lavender.**

52645. "Variety *Nana Glasnevin.*"

52646. "Variety *Twickel Purple.*"

52647. MALUS SYLVESTRIS Mill. Malaceæ. **Apple.**
(*Pyrus malus* L.)

"Variety *aldenhamensis.* A rooted sucker of the original tree."

52648. PAEONIA LUTEA Delavay. Ranunculaceæ. **Peony.**

One of the most beautiful of the yellow species, found in Yunnan in 1892. It is a hardy species and is a choice plant for garden effect. The clear-yellow flowers are about 3½ inches in diameter. (Adapted from *The Garden, vol. 61, p. 267,* and *vol. 76, p. 416.*)

52622 to 52661—Continued.

52649 to 52657. PHILADELPHUS LEMOINEI Lemoine. Hydrangeaceæ.

52649. *"Avalanche."* **Mock orange.**

A most graceful shrub 5 to 6 feet high, with whiplike slender branches mostly erect. It has smallish lanceolate leaves, and the parentage of *Philadelphus microphyllus* can be readily detected. The handsome single fragrant flowers, in numerous small clusters, open about June 26. (Adapted from *Garden Magazine, vol. 29, p. 198.*)

52650. *"Bannierii."*

A remarkably showy form which blossoms about June 20; the long stout branches bear numerous clusters of three to four large pure-white semidouble flowers over 2 inches across. (Adapted from *Garden Magazine, vol. 29, p. 198.*)

52651. *"Bouquet blanc."*

A new variety of medium height, with pure-white flowers 1 inch across, in big clusters along the branches, bending them down with their weight.

52652. *"Boule d'Argent."*

A dwarf variety with large white double flowers, which are very fragrant.

52653. *"Candelabra."*

A variety 2 feet high, with large white flowers entirely covering the branches.

52654. *"Erectus."*

A new, very beautiful floriferous variety.

52655. *"Manteau d'Hermine."*

A small neat shrub which does not grow more than 2 to 2½ feet in 10 or 12 years. The branches have a spreading habit and bear small leaves which show strongly the characteristics of *Philadelphus microphyllus*. The double to semidouble pure-white flowers are borne in great profusion from all the stems about June 13.

52656. *"Mont Blanc."*

A free-branching, excellent garden shrub 5 feet high, with slender ascending stems. It bears profusely a wealth of pure-white fragrant blossoms about June 13.

52657. *"Oeil de pourpre."*

A variety with a purple disk.

52658. PICEA JEZOENSIS (Sieb. and Zucc.) Carr. Pinaceæ. **Spruce.**

A very beautiful hardy flat-leaved spruce 70 feet high, with branches spreading on the ground, a dense pyramidal habit, and beautiful orange-crimson staminate flowers. The leaves are silvery on the upper surface and rich green on the lower. This is the most widely distributed of the species of eastern Asia, ranging from the Amur region to Manchuria, Chosen, and northern and central Japan. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 3, p. 52*, and from *National Nurseryman, vol. 2¼, p. 420.*)

For previous introduction, see S. P. I. No. 20318.

52622 to 52661—Continued.

52659. PICEA SCHRENKIANA Fisch. and Mey. Pinaceæ. **Spruce.**

A large tree attaining a height of 100 feet, with ashy gray branchlets and large ovoid light-brown buds. The straight or curved rigid leaves are up to 1¼ inches long. The cylindric dark shining-brown cones are 3 to 4 inches long and 1 inch in diameter. This species forms large forests in Turkestan, north of 41° at 4,500 to 10,000 feet altitude, and extends eastward through Chinese territory along the Tianshan Mountains. (Adapted from *Clinton-Baker, Illustrations of Conifers, vol. 2, p. 48.*)

52660. RUBUS sp. Rosaceæ.
"Forrest No. 15329."

52661. RUBUS sp. Rosaceæ.
"Forrest No. 15334."

52662 and 52663.

From Yokohama, Japan. Seeds purchased from the Yokohama Nursery Co. Received February 28, 1921, at the Plant Introduction Garden, Chico, Calif.

52662. AMYGDALUS DAVIDIANA (Carr.) Zabel. Amygdalaceæ.
(*Prunus davidiana* Franch.)

For use as stock.

For previous introduction, see S. P. I. No. 46694.

52663. PRUNUS SERRULATA Lindl. Amygdalaceæ. **Flowering cherry.**

Introduced for experimental purposes.

52664 and 52665. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Coimbatore, India. Seeds presented by U. Vittal-Rao, Experiment Station, Agricultural College. Received March 17, 1921. Quoted notes by Mr. Vittal-Rao.

52664. *"J 213."*

52665. *"Kassoer."*

52666. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Sydney, New South Wales, Australia. Seeds presented by George Valder, director, Department of Agriculture. Received March 24, 1921.

"*Timothy* grass from Glen Innes Experiment Farm. This seed is from what is described as the best growth of timothy grass ever obtained at Glen Innes. The plants reached a height of over 2 feet and were characterized by exceptionally long seed heads." (*Valder.*)

52667. MALUS SYLVESTRIS Mill. Malaceæ. **Apple.**

(*Pyrus malus* L.)

From Platenice, Bohemia. Cuttings presented by Dr. Rudolph Kuráž, agricultural attaché, Czechoslovak Legation, Washington, D. C., through Dr. Ales Hrdlicka, curator, Division of Physical Anthropology, United States National Museum. Received March 21, 1921.

"These cuttings came from Platenice, in Bohemia, which lies about 200 meters above sea level. I assure you that they are from the very best source." (*Kuráž.*)

52668. MANGIFERA INDICA L. Anacardiaceæ. **Mango.**

From Honolulu, Hawaii. Plants and cuttings presented by Willis T. Pope, Horticulturist, Agricultural Experiment Station. Received March 17, 1921.

"*Pirie.* This variety is considered the best, at least for lowland conditions, of all the mangos that have been introduced into Hawaii. It is of medium size, inclining to the rounded form, with a distinct beak at the stigmatic point. The surface is smooth and when ripe is a pale yellow, beautifully marked with crimson where exposed to the sun. It is practically fiber-free, has a delightful aroma, and is as soft and juicy as a ripe peach. The seed is easily removed, so that the fruit can be served in halves and eaten with a spoon without the slightest inconvenience. In order to remove the seed, it is only necessary to make a cut circling the fruit, about midway its length, and extending as deep as the surface of the seed. Then, by a slight twisting motion, one-half of the fruit can be separated from the seed, leaving a smooth unbroken surface within. By cutting very slightly around the seed, it may easily be removed from the remaining half of the mango. The flavor is so unusually delicious as to put this mango in a class of its own in Hawaii. The *Pirie* is less subject than other varietes to the black spots caused by the fungus *Colletotrichum gloeosporioides* and, while not immune to the fruit-fly attacks, it either possesses a high degree of resistance or is not a preferred variety for the fly. No injured fruits were found on this variety in the station orchards this season, though crops of several of the other varieties were rendered almost worthless." (*Westgate, Report of the Hawaii Agricultural Experiment Station, 1919, p. 23.*)

52669 to 52689.

From Paris, France. Plants presented by Vilmorin-Andrieux & Co. Received February 21, 1921.

52669. ARALIA CACHEMIRICA Decaisne. Araliaceæ.

An unarmed herb 5 to 8 feet high, with quinately compound leaves; the 5 to 9 oblong-ovate leaflets, 4 to 8 inches long, are doubly serrate and glabrous or bristly on the veins beneath. Native to the Himalayas.

For previous introduction, see S. P. I. No. 30285.

52670. ARUNDINARIA AURICOMA Mitf. Poaceæ. **Bamboo.**

One of the most beautiful of the lesser bamboos. It forms a graceful sheaf of slender stems 2 to 3 feet high, well clothed with a peculiarly velvety foliage in gold and green. It appears to be quite hardy in most places and affords a glorious break of delicate color in shrubbery, woodland, or a large rock garden. At all seasons it is attractive without being aggressive and, as it never runs underground to any extent, may be planted anywhere. (Adapted from *The Garden, vol. 83, p. 271.*)

52671. ARUNDINARIA FASTUOSA (Marl.) Makino. Poaceæ. **Bamboo.**

The loftiest and stateliest of the hardy bamboos, this is superior to and different from *Arundinaria simoni* in the early fall of the stem-sheaths, in the short, crowded branches at each joint which give to each stem-growth a columnar appearance, and in the more tufted habit. It is only rarely that underground suckers appear any distance away from the parent clump, whereas in *A. simoni* they are rampant. The dark-green hollow stems, up to 22 feet high, are perfectly erect and round, except at the upper internodes which are flattened on one side. The

52669 to 52689—Continued.

branches are short and very leafy. The leaves, 4 to 8 inches long, are dark lustrous green above, glaucous on one side of the midrib beneath and greenish on the other. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 215.*)

For previous introduction, see S. P. I. No. 42652.

52672. ARUNDINARIA FORTUNEI (Van Houtte) A. and C. Rivière. Poaceæ. **Bamboo.**

A silver-variegated bamboo, from 2 to 7 feet high, a very hardy and free grower. The leaves, 5 inches long, are beautifully striated with white. (Adapted from *Gauntlett, Hardy Plants Worth Growing, No. 92, p. 285.*)

52673. ARUNDINARIA PUMILA Mitf. Poaceæ. **Bamboo.**

A very pretty and ornamental little dwarf bamboo. At first one might be tempted to confound this species with *Arundinaria humilis*, but closer observation leads to the conviction that it is quite a distinct species. It is not so tall, the bright-green leaves are darker, shorter, and narrower, and do not taper so gradually to a point as those of *A. humilis*. The tessellation is closer, the teeth of the serrated edges are if anything less conspicuous, and the nodes are less well defined and far less downy; but, on the other hand, they have a waxy bloom not to be found in *A. humilis*. The stem is much more slender and more entirely purple, except quite at the base. The culms are about 15 inches high, round, hollow, very slender, and about three-eighths of an inch in circumference, slightly flattened at the top. The internode is about 2½ inches long. The culms are not much branched. The leaves are about 5 inches long and up to three-fourths of an inch in breadth, rounded at the base, petiolated, and ending rather suddenly in a fine point. They are rather rough to the touch on both surfaces. This brilliant little plant is quite hardy and is a very effective ornament for some rocky nook where, as it does not seem much inclined to run at the roots, it may better be kept within bounds than some of its family. (Adapted from *Mitford, The Bamboo Garden, p. 98.*)

For previous introduction, see S. P. I. No. 41924.

52674. ARUNDINARIA PYGMAEA (Miquel) Kurz. Poaceæ. **Bamboo.**

A subshrub 6 inches in height, with solid branching culms and dense foliage. The leaves are 1 to 1½ inches long, rounded at the base, with rough, somewhat hairy margins, bright green above and whitish pubescent beneath. Native to Japan. (Adapted from *Miquel, Annales Musei Botanici Lugduno-Batavi, vol. 2, p. 286.*)

For previous introduction, see S. P. I. No. 42653.

52675. BUDDLEIA DAVIDII Franch. Loganiaceæ.
(*B. variabilis* Hemsl.)

"Variety *prostrata*." (*Vilmorin-Andrieux.*)

A more or less prostrate, low-branching form with lanceolate, relatively small leaves and pale flowers. Native to Hupeh, China. (Adapted from *Schneider, Illustriertes Handbuch der Laubholzkunde, vol. 2, p. 846.*)

52676. CLEMATIS BUCHANIANA DC. Ranunculaceæ. **Clematis.**

A very vigorous Himalayan species which will cover a large wall space with buoyant hairy leaves and is covered in September with cymes of

52669 to 52689—Continued.

pendent whitish yellow flowers which exhale a delicate perfume. (Adapted from *Vilmorin-Andrieux, Plantes Vivaces et a Massifs, 1921. p. 28.*)

52677. COTONEASTER DAMMERI RADICANS C. Schneid. Malaceæ.

This variety differs from the typical form in its long peduncles and constantly one or two flowered racemes. The fruit is globose and bright scarlet, and the normal habit of the plant prostrate and rooting. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 176.*)

For previous introduction, see S. P. I. No. 40574.

52678. DEUTZIA DISCOLOR Hemsl. Hydrangeaceæ.

"Variety *major*." (*Vilmorin-Andrieux.*)

A luxuriantly spreading shrub with branches so heavily laden with flowers that the tips bend over and trail the ground. The white flowers, larger than in the type, are sometimes slightly suffused with rose. (Adapted from *Gardening Illustrated, vol. 30, p. 307.*)

52679. FRAGARIA DALTONIANA J. Gay. Rosaceæ.

Himalayan strawberry.

A perennial stoloniferous plant with slightly hairy petioles 2 to 3 inches long and elliptic to obovate-elliptic membranous leaflets up to 1 inch long, covered with sparse white rigid hairs. The solitary one-flowered scape is a little shorter than the leaves. The oblong, cylindric glabrous fruit is about half an inch long. Native to alpine pastures in the Sikkim-Himalayas, at altitudes of 10,000 to 15,000 feet. (Adapted from *Journal of the Asiatic Society of Bengal, vol. 44, pt. 2, p. 206.*)

For previous introduction see S. P. I. No, 48286.

52680. FRAGARIA NILGERRENSIS Schlecht. Rosaceæ.

Nilghiri strawberry.

This vigorous and hardy strawberry was introduced from China under the direction of M. Maurice de Vilmorin and is remarkable for its tufted habit, hairy foliage, its small white flowers, and especially for its small, insipid, white, hairy fruits. (Adapted from *Journal Société Nationale d'Horticulture, vol. 21, p. 189.*)

For previous introduction, see S. P. I. No. 51616,

52681. JUGLANS INTERMEDIA VILMOREANA Carr. Juglandaceæ. **Walnut.**

A tree 80 feet high, possibly a hybrid between the European and American black walnut, with branches more upright than those of the European walnut, grayish bark, and bronze-colored young shoots. The buds are inclosed in fleshy, hairy scales. The fruit is intermediate between that of the two parents. The slightly coriaceous smooth dark-green ovate leaflets remain on the branches until killed by frost. The fruit is not produced every year, and never in large quantities; it is smooth and the nut is more deeply furrowed than that of the European species. The seed germinates well and produces plants resembling the parent. (Adapted from *Garden and Forest, vol. 4, p. 52.*)

For previous introduction see S. P. I. No. 22525.

52682. JUGLANS sp. Juglandaceæ. **Walnut.**

A new species of walnut.

52683. JUGLANS sp. Juglandaceæ. **Walnut.**

"No. 6164. M. V." (*Vilmorin-Andrieux.*)

52669 to 52689—Continued.

52684. MALUS SIKKIMENSIS (Hook. f.) Koehne. Malaceæ. **Crab apple.**
(*Pyrus sikkimensis* Hook. f.)

A wild crab-apple tree, common in Sikkim, which bears fruit only pleasantly edible when stewed with sugar. (Adapted from *Records of the Botanical Survey, India, vol. 1, No. 2, p. 11.*)

For previous introduction, see S. P. I. No. 33057.

52685. OSMANTHUS DELAVAYI Baill. Oleaceæ.

A beautiful evergreen shrub from southwestern China, with dense axillary clusters of pure-white flowers. The dark-green ovate leaves are an inch long and have serrate margins. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 55, p. 257.*)

For previous introduction, see S. P. I. No. 48332.

52686. PHYLLOSTACHYS FLEXUOSA A. and C. Rivière. Poaceæ. **Bamboo.**

A graceful bamboo 8 to 10 feet high, with tall, slender, slightly zigzag canes changing from green to bright yellow. The dark-green, rather small leaves are bent. The plant has a most graceful aspect, the lithe branches being swayed by the gentlest breeze. One of the hardiest of the bamboos, this species is quite distinct. (Adapted from *Gauntlett, Hardy Plants Worth Growing, No. 92, p. 294.*)

52687. PYRACANTHA CRENULATA (Don) Roemer. Malaceæ.
(*Crataegus crenulata* Roxb.)

"A shrub of medium small dimensions, closely allied to *Crataegus pyracantha* (*Pyrancantha coccinea*) having small glistening green leaves and bearing a multitude of bright-red berries. Found on stony places at altitudes of 3,000 to 5,000 feet. It is of value as a very ornamental rockery shrub for those sections of the United States where the temperature is never very low." (*F. N. Meyer.*)

For previous introduction, see S. P. I. No. 40737.

52688. PYRUS sp. Malaceæ.

"*Mandchouriea.*" (*Vilmorin-Andrieux.*)

52689. VIBURNUM SIEBOLDII Miquel. Caprifoliaceæ.

A wide-spreading shrub from Japan, sometimes reaching a height of 10 to 15 feet. If the leaves are bruised or crushed in the hand, the odor is anything but agreeable, but otherwise it is not noticeable. The flowers, in large flat clusters, are cream colored or almost white and borne in moderate-sized heads during June. In August the fruit clusters assume a rich crimson color and are very conspicuous and ornamental, but in September they turn black and soon drop. (Adapted from *Gardening Illustrated, vol. 39, p. 405.*)

52690 to 52700. CARAGANA spp. Fabaceæ.

From Paris, France. Cuttings presented by Vilmorin-Andrieux & Co. Received February 21, 1921.

52690. CARAGANA ARBORESCENS Lam. **Siberian pea tree.**

"Variety *nana.*" (*Vilmorin-Andrieux & Co.*)

A quaint-looking dwarf shrub with stiff contorted branches which grow slowly. It is usually grafted on the type, from which it does not differ in leaf or flower. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 288.*)

52690 to 52700—Continued.

52691. CARAGANA ARBORESCENS Lam. **Siberian pea tree.**

"Variety *sophoraefolia*." (*Vilmorin-Andrieux & Co.*)

A form of *Caragana arborescens* with extremely small leaflets. (Adapted from *Schneider, Illustriertes Handbuch der Laubholzkunde, vol. 2, p. 95.*)

For previous introduction, see S. P. I. No. 52451.

52692. CARAGANA ARBORESCENS CUNEIFOLIA (Dipp.) C. Schneid. **Siberian pea tree.**

A small form of *Caragana arborescens* with truly cuneate leaves. (Adapted from *Schneider, Illustriertes Handbuch der Laubholdzkunde, vol. 2, p. 95.*)

52693. CARAGANA FRUTEX (L.) Koch.

A handsome bushy shrub, native to Siberia and quite hardy in England, with smooth spreading branches and pinnate leaves with two pairs of leaflets which are very close to each other at the point of the petiole; the pale-green leaflets are obovate. The bright-yellow flowers, solitary or in pairs, are produced in the abortive shoots of the last year. The peduncles are long and slender, jointed, and smooth. (Adapted from *Sweet, British Flower Garden, vol. 3, p. 227.*)

52694. CARAGANA FRUTEX (L.) Koch.

"Variety *pygmaea*." (*Vilmorin-Andrieux & Co.*)

A dwarf form.

52695. CARAGANA FRUTEX (L.) Koch.

"Variety *sylvatica*." (*Vilmorin-Andrieux & Co.*)

52696. CARAGANA GRANDIFLORA DC.

A densely branching shrub with shining brown bark ornamented with white longitudinal streaks. The spiny stipules are reflexed and spreading; the paired spiny mucronate leaves, 4 to 7 centimeters long, are clustered at the tips of the branchlets. The ovate-oblong shining leaflets are cuneate at the base and 1 to 10 millimeters long. The yellow flowers, 6 to 10 millimeters long, are often solitary on peduncles 10 to 12 millimeters long. (Adapted from *Komarov, Acta Horti Petropolitani, vol. 29, p. 219.*)

For previous introduction, see S. P. I. No. 30546.

52697. CARAGANA MICROPHYLLA Lam.

"Variety *glomerata arenaria*." (*Vilmorin-Andrieux & Co.*)

A form of *Caragana microphylla*, variety *glomerata*, which has a rachis about 6 to 7 centimeters long and ovate or elliptic leaves about 2 to 6 centimeters long. (Adapted from *Komarov, Acta Horti Petropolitani, vol. 29, p. 350.*)

52698. CARAGANA PYGMAEA (L.) DC.

A handsome shrub with small leaves and yellow flowers, which grows spontaneously in hilly places in the southern provinces of Russia, especially about the River Tschargurban, also in great abundance in all the provinces south of Lake Baikal. In cultivation it rarely exceeds 4 feet, but in its wild state it is often 6 feet high with a stem 2 inches thick. The shoots when old are long and flexible, of bright-yellow color, and are

52690 to 52700—Continued.

made into flyflaps by the inhabitants of the country where it grows wild. The shoots are much tougher than those of any of our cultivated osiers and are better suited to be used for tying. The hard, dull-brown wood is streaked with red and is well adapted for veneering. (Adapted from *Edwards's Botanical Register, vol. 12, p. 1021.*)

For previous introduction, see S. P. I. No. 42282.

52699. CARAGANA SIBIRICA Medic.

A Siberian species of the ornamental Caraganas, shrubs grown chiefly for their bright-yellow flowers. The leaves are abruptly pinnate, with small entire leaflets. The pods are terete, linear, and straight.

52700. CARAGANA sp.

An unidentified form.

52701. LITCHI CHINENSIS Sonner. Sapindaceæ. **Lychee.**
(*Nephelium litchi* Cambess.)

From Zarfarwal, Punjab, India. Seeds presented by H. S. Nesbitt, American United Presbyterian Mission. Received January 25, 1921.

"This is counted a delicious fruit here, and the barky shell inclosing the sweet juicy pulp makes it easily transportable." (*Nesbit.*)

For previous introduction and description, see S. P. I. No. 51472.

52702 to 52714.

From Paris, France. Cuttings presented by Vilmorin-Andrieux & Co. Received February 21, 1921.

52702. CORNUS WALTERI Wangerin. Cornaceæ.

A tree 40 feet high, with white flowers and blue-black fruits, growing in woodlands at 900 to 2,000 feet altitude in western Hupeh, China. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 576.*)

For previous introduction, see S. P. I. No. 34566.

52703. HYDRANGEA sp. Hydrangeaceæ.

Received without description.

52704. LONICERA sp. Caprifoliaceæ.

Received without notes.

52705. × POPULUS RASUMOWSKIANA Schroed. Salicaceæ. **Poplar.**

A hybrid between *Populus nigra* and *P. suaveolens.* It is a large tree with roundish leaves smaller than in *P. petrovskoe.* The shoots are cylindrical. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 18, p. 108.*)

52706. RIBES CYNOSBATI L. Grossulariaceæ. **Gooseberry.**

A shrub about 6 feet high, native to eastern North America, with reddish purple fruits, scarcely half an inch in diameter and more or less covered with slender prickles. (Adapted from *Jacquin, Hortus Botanicus Vindobonensis, seu Plantarum Rariorum, pl. 123.*)

52707. RIBES LONGERACEMOSUM Franch. Grossulariaceæ. **Currant.**

"This species, found in the mountains of western China, bears large black fruits of good flavor in racemes a foot and a half long." (*E. H. Wilson, A Naturalist in Western China, vol. 2, p. 31.*)

For previous introduction, see S. P. I. No. 51617.

52702 to 52714—Continued.

52708. RIBES PETRAEUM Wulf. Grossulariaceæ. Currant.

Another of the red currant group widely spread in a state of nature in Europe and North Africa. It has no value as an ornamental shrub, its flowers being green suffused with purple, somewhat bell shaped, in horizontal or slightly nodding racemes 3 or 4 inches long. The leaves are more deeply lobed than in the common red currant, and the lobes are pointed. The fruit is roundish, flattened somewhat at the end, red, and very acid. (Adapted *from Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 409.*)

For previous introductions, see S. P. I. No. 40472.

52709. RIBES PETRAEUM CAUCASICUM (Bieb.) Janez. Grossulariaceæ. Currant.

A shrub 1 to 3 meters high, with glabrous shoots and rounded leaves up to 13 centimeters broad and 12 centimeters long, ordinarily five lobed, the lobes little developed. The reddish flowers are in racemes up to 10 centimeters long. The receptacle is furnished with five tubercles below the petals, and the fruit is red or blackish purple. (Adapted from *Janczewski, Monographie des Groseilliers, p. 290.*)

For previous introduction, see S. P. I. No. 40426.

52710. RIBES USSURIENSE Janez. Grossulariaceæ. Currant.

A much-branched shrub 1 millimeter high, producing rhizomes like those of *Ribes aureum;* the shrub has an odor resembling that of camphor. The glabrous leaves dotted below with yellow glands are 8 centimeters long and broad and three to five lobed. The loose arched racemes, 1 to 1½ centimeters long, bear five to nine whitish flowers briefly campanulate. The round fruit, as large as a currant, is black (greenish blue before ripening), not aromatic, and with greenish, slightly sweet acidulous flesh. The small ovoid seeds have a greenish gelatinous coating and an inflated funiculus. The fruit falls as soon as it is ripe and the seeds germinate in 22 to 50 days. The floral buds are very sensitive to winter cold. (Adapted from *Janczewski, Monographie des Groseilliers, p. 349.*)

For previous introduction, see S. P. I. No. 40488.

52711. RIBES VILMORINI Janez. Grossulariaceæ. Currant.

A shrub 2 meters high, with glabrous branches which are red when young. The development and flowering are very slow; the small cordate leaves are 2 to 3 centimeters long and wide and are covered on the under surface with glandular hairs. The small greenish flowers are sometimes slightly tinged with brownish red and are in small clusters of two to eight. The small round black, glabrous fruit is capped with the flower, which does not dry up. The slightly sweetish flesh is pale or veined with purple-black. The fruit ripens in August and remains unchanged on the bush until October. Native to middle China, Tibet, and Yunnan. (Adapted from *Mémoires Société Physique et Histoire Naturelle, Geneve, vol. 35, p. 462.*)

52712. SPIRAEA MYRTILLOIDES Rehder. Rosaceæ. Spirea.

For previous introduction and description, see S. P. I. No. 52459.

52713. SYRINGA CHINENSIS Willd. Oleaceæ. Lilac.

A deciduous bush of dense rounded habit, 10 to 15 feet high, with flowers of the common lilac shade, intermediate in size between those

52702 to 52714—Continued.

of the common and Persian lilacs, and in somewhat loose clusters. The growths made during the summer produce the following May a pair of flower trusses 3 to 6 inches long at each joint toward the end, so that the whole makes a heavy arching, compound panicle. The seeds are fertile only occasionally. Native to China. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 566.*)

Received as *Syringa correlata*, which is now referred to *S. chinensis*.

52714. VIBURNUM sp. Caprifoliaceæ.

Received without description.

52715 to 52735.

From Ambato, Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received February 12, 1921. Quoted notes by Mr. Popenoe.

52715. BUNCHOSIA ARMENIACA (Cav.) DC. Malpighiaceæ.

"(No. 541a. Banos, near Ambato, Ecuador, 6,000 feet altitude. January 10, 1921.) *Ciruela verde* or *ciruela silvestre*. This species is considered to be indigenous in the Pastaza Valley below Banos. It is commonly cultivated in the latter town, and occasionally in the gardens of Ambato, but the climate of the latter region is slightly too cool for it. In Loja it is well known, as also in Otavalo and Ibarra. The plant attains about 15 feet in height and is quite attractive. The glossy deep-green leaves are elliptic-acuminate, 3 to 6 inches long, and rather leathery; the small yellow flowers are produced in short axillary racemes. The fruits are round or nearly so, 1 to 2 inches in diameter, and light green to yellowish green. Within the thin delicate skin is a mass of cream-colored, very sweet pulp in which one or two large seeds are embedded. The plant is probably too tender for any section of the United States except southern Florida."

52716. CARICA sp. Papayaceæ. **Chamburo.**

"(No. 546a. Ambato, Ecuador. January 12, 1921.) This plant is called *chilhuacan* in the gardens of Imbabura Province, where it is quite common; the same name is also used at Quito, where the species is fairly well known. In Tungurahua Province it is termed *chamburo*, while in the Azuay it is known as *siglalon*. In Loja it is more frequently seen as a wild than as a cultivated plant and is called *chamburo*. Its zone is approximately from 6,000 to 10,000 feet.

"The plant, which reaches a height of 15 to 20 feet, has a trunk somewhat stouter than that of the papaya and leaves which strongly resemble those of the latter in size and character. It is irregularly dioecious, at least when brought under cultivation. I have seen at Ambato plants bearing principally staminate flowers, but carrying at the same time a good number of fruits apparently normal in form and size. Many specimens produce pistillate flowers only, and some staminate only. The fruits, which are sold in the markets of numerous interandean towns, are elliptic, sharply pointed at the apex, and deeply five ribbed. By means of this latter characteristic they can easily be distinguished from those of the *higacho* (*Carica* sp., S. P. I No. 53758). They are deep orange when fully ripe, and possess a fragrance quite distinct from that of the papaya. The flesh is about half an inch in thickness; it is eaten usually after cooking in the form of a sweet conserve. The numerous

52715 to 52735—Continued.

seeds, resembling those of the papaya in size, are embedded in a gelatinous translucent pulp which fills the central cavity of the fruit and is sometimes eaten. The species is indigenous in the Andes of northern South America. In the vicinity of Bogota, Colombia, it is abundantly cultivated. It is probably sufficiently hardy to withstand the winters of southern California and southern Florida."

For an illustration of the chamburo, see Plate III.

52717. RUBUS GLAUCUS Benth. Rosaceæ. Andes berry.

"(No. 557a. Ambato, Ecuador. January 12, 1921.) *Mora de Castilla.* The Andean raspberry, the common dark maroon-fruited variety. This excellent fruit, native to the mountainous regions of Ecuador (as well as to several other tropical American countries) has received a certain amount of cultural attention at Ambato, Quito, Otavalo, and Ibarra, with the result that several varieties have originated. At Ambato there are two, the common sort with dark maroon-colored fruits and another with light-red fruits, somewhat more delicate in flavor than those of the common sort. The plant is half-climbing in habit and a vigorous grower. It covers arbors and fences, or can be trained into bush form, making a clump about 10 feet broad and high. The stems are round and covered with a thick whitish bloom; the leaves are trifoliolate, with the leaflets ovate-lanceolate, long-acuminate, serrate, about 3 inches in length, light green above and whitish below. The flowers are produced in terminal racemes sometimes a foot in length; they are white and about an inch in diameter. The fruits are oblong-oval, often an inch long, and composed of a large number of drupelets crowded closely together. The seeds are not so large as to be troublesome in the mouth, nor are they hard; the flavor resembles that of certain northern raspberries, being rich, aromatic, and very pleasant. Although excellent when eaten with sugar and cream, the fruit is more commonly used in Ecuador to prepare a sweet conserve or the sirup made in Otavalo, called *jarope de mora*, from which an excellent refresco is made.

"This plant grows on soils of various types, from clay to light sandy loams. It will probably require intelligent pruning to make it fruit abundantly. I believe it possesses great possibilities when cultivated in the southern and southwestern United States, since its fruits are larger than any of the raspberries we now grow and of excellent quality."

52718 and 52719. ZEA MAYS L. Poaceæ. Corn.

52718. "(No. 543a. Ambato, Ecuador. January 11, 1921.) *Morocho blanco.* An excellent white flint corn, grown in the vicinity of Ambato. It is used principally as human food, after grinding and preparation in the form of *mazamorra* (a sort of corn-meal mush); it is also used to make *chicha*, a fermented beverage. Of interest to those engaged in corn breeding."

52719. "(No. 542a. Ambato, Ecuador. January 11, 1921.) *Maiz amarillo.* Yellow starchy corn grown in the vicinity of Ambato, at an altitude of about 8,000 feet. For those interested in corn breeding."

52720. PRUNUS SEROTINA Ehrh. Amygdalaceæ. Capulin.

"(No. 544. Ambato, Ecuador. January 12, 1921.) *Ambato cherry.* This is a remarkable and most excellent variety of the capulin, famous throughout Ecuador. The parent tree is growing on the hacienda of

52715 to 52735—Continued.

Victor Oviedo, at Catiglata, near Ambato; it is usually known, however, as the 'Gonzales tree,' from the name of a former owner of the property.

"In size and quality of fruit this variety is far superior to the great majority of capulís seen in Ecuador and other tropical American countries. It is worthy of propagation by grafting and should be planted in all those regions where the capulí can be grown. It will probably succeed in California, and perhaps also in the Gulf States. It would be a valuable acquisition for the highlands of Mexico and Central America, as well as for other tropical countries where there are plateaus or cultivated regions at altitudes between 6,000 and 10,000 feet.

"The parent tree is probably very old and is one of the largest capulins I have seen. It is about 50 feet high and has a spread of 60 feet. Its fruits, which are very abundantly produced during the first months of the year (from January to March), are as large as the Black Tartarian cherry of California (three-quarters of an inch in diameter), dark maroon, with soft juicy flesh and a seed of about the same size as that of our northern cherries. The flavor is sweet and very agreeable, with a faint trace of bitterness if the fruit is not fully ripe."

52721. CARICA sp. Papayaceæ. Babaco.

"(No. 547. Ambato, Ecuador. January 12, 1921.) This is called *babaco* throughout the interandean region of Ecuador, where it is cultivated in many places, from Loja Province northward to Carchi Province. I have never seen it except in cultivation, and this only between 6,000 and 10,000 feet in altitude; nor have flowers other than purely pistillate ones been found on any of the numerous plants examined.

"This is, in fact, the most remarkable and valuable of the several interesting species of Carica cultivated in Ecuador. Because of its large fruits, which yield an excellent sauce, because of the relatively low temperatures which the plant can withstand, and because of its habit of producing seedless fruits it is worthy of attention in other countries. It is a smaller plant than *Carica papaya*, rarely reaching more than 10 feet in height. The stem is usually slender, especially when the plants are set closely together, as they are in the small commercial plantations of Ambato. The leaves are glabrous like those of the *higacho* (*Carica* sp., S. P. I. No. 53578), but with fewer lobes than in the latter. The fruits are commonly about a foot long and 3 to 5 inches in diameter; they are truncate at the base, sharply acute at the apex, and conspicuously 5-angled in transverse outline. The flesh is about half an inch in thickness, nearly white, distinctly fragrant, and very acid. It is eaten only after cooking. The large cavity in the center of the fruit contains a quantity of white cottony substance and occasionally a few seeds. The latter are possibly produced when the flowers are fertilized with pollen of other species of Carica (since staminate flowers of the *babaco* are not seen in cultivation).

"The plant is propagated by cuttings and in no other manner. Whether it represents a wild species which I have not seen, or whether it has been derived by cultivation from the *higacho*, I am unable to say; the latter hypothesis does not appear unreasonable. It is worthy of a careful trial in California and Florida."

Fruits of the babaco are shown in Plate IV.



THE CHAMBURO, AN INTERESTING RELATIVE OF THE PAPAYA. (CARICA SP., S. P. I. No. 52716.)

The chamburo is indigenous in the Andes of northern South America and will probably be sufficiently hardy to withstand the winters of southern California and southern Florida. The fruit flesh is half an inch thick and is usually eaten, after being cooked, in the form of a sweet conserve. (Photographed by Wilson Popenoe, Banos, Tungurahua, Ecuador, March 11, 1921; P18482FS.)



FRUITS OF THE BABACO, ONE OF THE MOST VALUABLE SPECIES OF CARICA CULTIVATED IN ECUADOR.
(CARICA SP., S. P. I. No. 52721.)

The babaco is particularly worthy of attention because of its large, usually seedless fruits, which yield an excellent sauce, and because of the relatively low temperatures that it can withstand. Like the chamburo, it will probably do well in southern California and southern Florida. (Photographed by Wilson Popenoe near Ambato, Ecuador, January, 1921; P18377FS.)



A RED-FRUITED VARIETY OF THE ANDES BERRY. (RUBUS GLAUCUS BENTH., S. P. I. No. 52734.)

The Andes berry is one of the most promising fruits of this group introduced from South America, and the berries of the red-fruited variety (which is very rare) have a more delicate flavor than those of the common purplish fruited form. The luscious fruits resemble our blackberries, and some varieties are said to be superior in flavor. (Photographed by Wilson Popenoe, near Ambato, Ecuador, January, 1921; P18356FS.)



THE TALIPOT PALM OF TROPICAL ASIA. (CORYPHA UMBRACULIFERA L., S. P. I. No. 52802.)

Often growing to a height of more than 80 feet, this giant palm attains a spread of about 200 square feet. The seeds are dyed red and sold as coral for beads, the pith of the trunk yields a kind of sago, and the leaves are made into fans and mats. It will probably do well in Porto Rico, and in the Canal Zone and other parts of tropical America. (Photographed by J. F. Rock, Okima, Burma, January, 1921; (P22686FS.

52715 to 52735—Continued.

52722 to 52730. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

52722. "(No. 555. Ambato, Ecuador. January 12, 1921.) *Calvache* potato, grown near Ambato. This is a productive and late-maturing variety, grown mainly at the lower altitudes. The tubers are elliptic-obovate and compressed to long and slender in form, of medium size, with a light rose-pink surface marked with very few and shallow eyes. The flesh is white and of good quality."

52723. "(No. 551. Ambato, Ecuador. January 12, 1921.) *Dominga* potato, grown near Ambato. This variety, which is cultivated at the lower altitudes of this region, is moderately productive. The tubers are medium sized, roundish oval, light rose colored, with white flesh of good quality. One of the most important commercial varieties."

52724. "(No. 552. Ambato, Ecuador. January 12, 1921.) *Huagrasinga* potato, grown near Ambato. This is a late-maturing variety, with tubers irregularly round, pale yellow brown, with violet-colored areas around the rather deep eyes. The flesh is white, of fair quality. It is slightly resistant to late-blight and is grown at both high and low altitudes."

52725. "(No. 549. Ambato, Ecuador. January 12, 1921.) *Inglesa* potato, grown near Ambato. This moderately productive, late-maturing variety has round, good-sized tubers of dark violet, with moderately numerous and deep eyes. The flesh is white and of good quality. This has proved at Ambato to be the most resistant to late-blight of all the varieties tested."

52726. "(No. 554. Ambato, Ecuador. January 12, 1921.) *Leona* potato, grown near Ambato. A late-maturing, productive variety which is most successful at the higher altitudes. The tubers are round, medium to large, brown, the eyes few and not very deep. The flesh is white, and superior in quality to that of all others cultivated in the Ambato region. The keeping qualities of the variety are excellent."

52727. "(No. 550. Ambato, Ecuador, January 12, 1921.) *Leona Pazmina* potato, grown near Ambato. This late-maturing and moderately productive potato yields tubers of oval to round form, medium size, dark-red color, with moderately few and not very deep eyes. The flesh is white and of excellent quality. The plant, which grows best at high altitudes, is moderately resistant to late-blight. The variety keeps better than most of the others known at Ambato."

52728. "(No. 556. Ambato, Ecuador. January 12, 1921.) *Manzana* potato, grown near Ambato. This productive and late-maturing variety, cultivated mainly at the lower altitudes of the Ambato region, produces tubers of irregularly round form, medium size, with a rose-pink surface and rather numerous and deep eyes marked with yellow. The flesh is white and of good quality. The plant is not resistant to late-blight."

52729. "(No. 548. Ambato, Ecuador. January 12, 1921.) *Tabla* potato, grown near Ambato. This is one of the largest potatoes cultivated in Ecuador. The plant is very productive, and the tubers, which mature rather late in the season, are elongated,

52715 to 52735—Continued.

flattened, light red, with few and not very deep eyes. The flesh is white and of good quality. The plant has shown itself fairly resistant to late-blight."

52730. "(No. 553. Ambato, Ecuador. January 12, 1921.) *Yungara* potato grown near Ambato. This productive and late-maturing variety yields oblong medium-sized tubers, light rose colored with yellow areas around the few and not very deep eyes. The flesh is white and of good quality; the plant is not resistant to late-blight. One of the important commercial potatoes of central Ecuador."

52731. FRAGARIA CHILOENSIS (L.) Duchesne. Rosaceæ. **Chilean strawberry.**

"(No. 550. Guachi Grande, near Ambato, Ecuador. January 12, 1921.) *Ambato* strawberry. Of unusual interest for culture in the Southwest."

For previous introduction, see S. P. I. No. 52576.

52732. PYRUS COMMUNIS L. Malaceæ. **Pear.**

"(No. 540. Ambato, Ecuador. January 11, 1921.) *Pera nacional* or *pera común*, from a huerta near Ambato. For trial as stock plants.

"This small pear, probably introduced into Ecuador by the Spaniards in colonial times, is cultivated commercially in the vicinity of Ambato, whence the fruits are carried to Quito, Guayaquil, and other points in the Republic. It is also grown in the Azuay, near Cuenca. Propagation is by suckers which spring up abundantly beneath the old trees.

"The species is vigorous in habit, trees sometimes reaching 25 feet in height and producing their fruits in great abundance. The ripening season at Ambato is from January to March. The fruit is pyriform, an inch or slightly more in length, yellow, and firm in texture even when fully ripe. The flesh is white, rather mealy, not very juicy, and of a mild, pleasant flavor. It is very rare for any seeds to be found. The plant is often used at Ambato as a stock on which to graft the large-fruited pears known as *peras de manteca*."

52733 and 52734. RUBUS GLAUCUS Benth. Rosaceæ. **Andes berry.**

For previous introduction, see S. P. I. No. 52717.

52733. "(No. 539. Ambato, Ecuador. January 11, 1921.) *Mora de Castilla*, or Andes berry."

52734. "(No. 545. Ambato, Ecuador. January 12, 1921.) *Mora de Castilla.* A red-fruited variety of this excellent Andean berry, obtained from Prof. Abelardo Pachano. This variety is rare, and its fruits are of a more delicate flavor than the common sort. It should have a careful trial in the southern and southwestern United States."

For a more thorough discussion of this berry the reader is referred to the Journal of Heredity, vol. 12, pp. 387 to 393.

A fruiting spray and several fruits of the Andes berry (natural size) are shown in Plate V.

52735. DATURA SANGUINEA Ruiz and Pav. Solanaceæ.

"(No. 558b.) From a dooryard in Ambato. Seed pods of the common datura cultivated as an ornamental plant in the vicinity of Ambato. The flowers are orange-red."

52736. DIGITARIA EXILIS (Kippist) Stapf. Poaceæ. **Fundi grass.**

From Sierra Leone, Africa. Seeds presented by D. W. Scotland, Director of Agriculture, Njala, Mano. Received March 23, 1921.

"An annual grass, much resembling crabgrass, grown by Nigerian tribes as a supplementary food grain. This grass, called by natives 'fundi,' is often grown in the millet fields, and yields a crop of fine seed which is made into flour for the preparation of a kind of porridge. *Fundi* was known in Africa in 1798, but it was first brought into England in 1842 by R. Clarke, who describes the grain as about the size of mignonette seed. It is sown in May or June, carefully weeded in August, and ripens in September. The plant grows to a height of 18 inches, and the slender stems bend to earth by the weight of the grain. It prefers light or even rocky soil. Clarke says the grain is 'delicious' for food. *Fundi* was tested at McNeill, Miss., in 1920, and it is believed that it will give from three to five cuttings of hay in a season or a larger amount of pasturage." (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 49524.

52737 and 52738. TRITICUM AESTIVUM L. Poaceæ. (*T. vulgare* Vill.) **Common wheat.**

From St. Jean le Blanc, Orleans, France. Seeds presented by M. Edmond Versin. Received March 11, 1921. Quoted notes by M. Versin.

52737. "*Blé de Chine No. 1.* Extra early, a little bearded; this took a diploma of honor as the finest head at Bordeaux, France."

52738. "*Blé de Chine No. 2.* Very early and beardless."

52739. PRUNUS ARMENIACA L. Amygdalaceæ. **Apricot.**

From Haifa, Palestine. Seeds presented by Amram Khazanoff, Jewish Colonization Association. Received March 11, 1921.

"Seeds of the *Musmush kelabi*, the bitter-kerneled apricot or dog's apricot, which is used in the Damascus region as stock for grafting the apricot under irrigation. The fruit of the *Musmush kelabi* is used for the manufacture of apricot paste, or *kamr-ed-din*." (*Khazanoff.*)

52740 to 52744.

From Medellin, Colombia. Seeds presented by W. O. Wolcott. Received March 17, 1921.

52740. CYPHOMANDRA BETACEA (Cav.) Sendt. Solanaceæ. **Tree-tomato.**

An evergreen, semiwoody plant, cultivated throughout the Tropics for its edible, ovoid, smooth-skinned fruits. When mature these reddish yellow fruits have an agreeable subacid flavor and although pleasant when eaten fresh are used chiefly for stewing and for jam or preserves.

52741 to 52743. Poaceæ.

"These grasses grow from 2 to 4 feet tall. They apparently require very little moisture, for I gathered some from cracks in the rocks. The natives say they are fine for fattening stock." (*Wolcott.*)

52741. ANDROPOGON MINARUM (Nees) Kunth. **Beard-grass.**

A large perennial grass allied to the bluestem of the eastern United States.

52740 to 52744—Continued.

52742. MELINIS MINUTIFLORA Beauv. **Molasses grass.**

A stout perennial with viscid pubescent foliage and narrow many-flowered panicles of very small awned spikelets. (Adapted from *Hitchcock, United States Department of Agriculture Bulletin No. 772.*)

52743. PENNISETUM SETOSUM (Swartz) L. Rich. **Mission grass.**

A tall perennial grass related to pearl millet; native to South America and Central America.

52744. VICIA FABA L. Fabaceæ. **Broad bean.**

"The beans are native here. The natives use them as food and also as stock feed. The stalks grow very rank, from 2 to 3 feet high, and are from one-fourth to one-half of an inch thick; they are covered with heavy leaves all the way from the ground up. The natives call them *habas silvestre*." (*Wolcott.*)

52745 to 52751.

From Moulmein, Burma. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received March 18, 1921. Quoted notes by Mr. Rock.

52745. ANNONA RETICULATA L. Annonaceæ. **Custard-apple.**

"Seed from choice and delicious fruits of '*bullock's-heart*.'"

52746. BAUHINIA MALABARICA Roxb. Cæsalpiniaceæ.

"(Western Siam. December 16, 1920.) A large tree 30 to 40 feet in height, with a large round crown and thousands of long pendent racemes; flowers not seen; found in dense forest near Raheng, western Siam."

52747. BAUHINIA sp. Cæsalpiniaceæ.

"(Myawaddi, Burma. December 21, 1920.) A shrub or small tree in dry forests of eastern Burma, one day's journey from the Siamese boundary. The flowers are arranged in threes in the axils of all the leaves, standing erect on the upper surface of the branches."

52748. BOMBAX INSIGNE Wall. Bombacaceæ. **Cotton tree.**

"A large forest tree of the lowland jungle found along the banks of the Meping River, western Siam. The tree reaches a height of 80 to 100 feet. The floss is used by the natives for stuffing pillows; it is also spun."

52749. IPOMOEA HORSFALLIAE Hook. Convolvulaceæ. **Morning-glory.**

"Variety *briggsii*. A splendid crimson-flowered morning-glory which reaches large dimensions and is, of course, a perennial. It flowers for many months during the year, especially during the cold season; the crimson flowers are borne in large clusters."

52750. LAGERSTROEMIA sp. Lythraceæ.

"An ornamental tree 30 feet in height, with showy pink flowers. It grows in the very dry jungle beyond Palut, western Siam, with *Strychnos nux-vomica, Dipterocarpus tuberculatus, Cassia fistula*, etc. It is worthy of cultivation."

52751. ORYZA SATIVA L. Poaceæ. **Rice.**

"Black rice from Oktada Martaban; fresh seed from this year's yield."

52752 and 52753. LUPINUS spp. Fabaceæ.

From Paris, France. Seeds presented by Vilmorin-Andrieux & Co. Received March 30, 1921.

52752. LUPINUS ALBUS L. Fabaceæ. **White lupine.**

"A tall-growing lupine with white flowers. The variety *vulgaris* is cultivated in southern Europe. Formerly this variety was cultivated in Germany but usually does not mature there. The bitter principle in both seeds and plants make the crop useful only for green manuring. In Germany it has been superseded by the yellow lupine." (*A. J. Pieters.*)

For previous introduction, see S. P. I. No. 39347.

52753. LUPINUS LUTEUS L. Fabaceæ. **Yellow lupine.**

"A species native to southern Europe and cultivated especially in Germany for green manure. It is more resistant to drought than the white, and will thrive on thin, lime-poor soils. This plant does not make as large a mass of growth as the white but ripens earlier." (*A. J. Pieters.*)

For previous introduction, see S. P. I. No. 39349.

52754. AVICENNIA OFFICINALIS L. Verbenaceæ. **White mangrove.**

From Manila, Philippine Islands. Cuttings presented by Adn. Hernandez, director, Bureau of Agriculture. Received February 9, 1922.

A small Philippine tree found along the outer edges of swamps; the dark-green, leathery leaves are hairy beneath and about 4 inches long. The small, orange-yellow flowers are borne in few-flowered heads, and the fruit is a single-seeded capsule. The wood is hard, heavy, difficult to split, and is rarely attacked by beetles. (Adapted from *Brown, Minor Products of Philippine Forests, vol. 1, p. 80.*)

52755. ALEURITES MOLUCCANA (L.) Willd. Euphorbiaceæ. (*A. triloba* Forst.) **Lumbang.**

From Dania, Fla. Nuts presented by George W. Bloom. Received December 20, 1920. Numbered March 31, 1921.

"*Candlenut.* The tree is 50 feet high with a spread of 30 feet. It bore 2 bushels or more of nuts. Three young plants that came up under the tree were pulled up and planted in cans in the latter part of August, and they are now 2 feet high; these will be planted on my place here in Dania the last of this month. There are also two plants from nuts sprouted in cans. Three uncracked nuts were planted and three that were cracked just enough to break the shell. Two of the cracked nuts developed into trees. The nuts have been given to everyone that cared to try or plant them. Apparently the kernels are not injurious, as they have been eaten by a number of children with no noticeable ill effects." (*Bloom.*)

52756 to 52773.

From Bedford, England. Plants presented by Laxton Bros. Received March 15, 1921. Quoted notes from Laxton, Strawberries and Small Fruits, 1919 and 1920.

52756. FRAGARIA MOSCHATA Duchesne. Rosaceæ. **Hautbois strawberry.**

"*Royal.* A fine alpine form, with rich aromatic flavor."

52757. FRAGARIA VESCA L. Rosaceæ. **Wood strawberry**

"*Red Alpine.* The best form of alpine strawberry."

52756 to 52773—Continued.

52758 to 52762. FRAGARIA spp. Rosaceæ. **Garden strawberry.**

52758. "*International.* A plant of very compact growth and robust habit, producing long, leathery, vigorous foliage and very handsome wedge-shaped fruit which ripens about midseason. The bright, glowing-scarlet fruit has white flesh, very rich in flavor, and particularly firm and solid in texture."

52759. "*King George V.* A fine, new, early, forcing, and outdoor strawberry raised by crossing *Louis Gauthier* × *Royal Sovereign.* It is a really magnificent fruit quite as large as, if not larger than, *Sovereign*, but it ripens nearly a week earlier, when grown side by side. The fruit is the brightest scarlet, but the flesh is orange-red throughout. The flavor is delicious, excelling *Royal Sovereign* or any other forcing strawberry with which we are acquainted. It is a heavier cropper than *Sovereign*, forms splendid crowns, and sets and swells particularly freely."

52760. "*La Perle.* A very fine everbearing variety of French origin. The large light-scarlet fruit has firm sweet flesh."

52761. "*Maincrop.* A hybrid between *Bedford Champion* and *Laxton*, producing fruit which combines size with flavor. A particularly vigorous grower throwing out a profusion of very bold large trusses of firm-textured, coxcomblike fruits. The color is very rich and the flavor good; both the outer skin and inner flesh are firm, which qualities will enable it to bear packing and transit well."

52762. "*White Perpetual.* A hybrid between *Louis Gauthier* and *St. Antoine;* it is a true perpetual throwing up its trusses of large, nearly white fruits until stopped by frost in November. The flavor is very sweet and luscious. The habit is similar to that of *St. Antoine.*"

52763 to 52772. RUBUS IDAEUS L. Rosaceæ. **European raspberry.**

52763. "*Abundance.* The richest flavored raspberry in cultivation, a red raspberry seedling raised in the Lincolnshire fruit-growing district, where it is being largely planted. The plant is a very strong grower and enormous cropper."

52764. "*Baumforth.* Baumforth's seedling is one of the best for general use; it produces an abundance of large dark-crimson excellent-flavored fruits."

52765. "*Bountiful.* The strongest grower and heaviest cropper in existence. The canes are strong and vigorous and entirely self-supporting. The handsome bright-crimson conical fruit is larger than that of *Superlative;* it is borne on long trusses. The flesh is sweet and juicy, but is firm and stands travel well. While *Superlative* and older sorts become worn out after many years' propagating from canes, this variety has all the vigor of a seedling. It is an improvement on the *Bedford*, which it resembles in color of fruit and foliage, except that the color is of a darker tint than that variety; the firm fruit is also larger and equally good in flavor."

52766. "*Devon.* A fine new red raspberry with a large conical fruit of fine flavor and bright color. A very strong grower."

52756 to 52773—Continued.

52767. "*Hornet.* A form with round deep-red berries produced in great clusters."

52768. "*Magnum Bonum.* An early fruiting raspberry with sweet white fruit, better than that of *Antwerp.*"

52769. "*Merveille de Rouge.* A fine autumn-fruiting raspberry, bearing in September on the young growth made in the same summer, large, very sweet fruits."

52770. "*Norwich Wonder.* An old but useful variety, bearing abundantly large excellent-flavored fruit."

52771. "*October Red.* An autumn-fruiting raspberry."

52772. "*Semper Fidelis.* A good cropper coming in after the others are over. It is more acid than others, and useful for preserving."

52773. RUBUS sp. Rosaceæ. **Blackberry.**

"*Edward Langley.* A variety selected after many years' trial by E. M. Langley, of Bedford, from the best of our common wild blackberries; it has proved to be a very fine acquisition under cultivation. It is better in flavor and crop than any of the American sorts."

52774. LINUM USITATISSIMUM L. Linaceæ. **Flax.**

From Gizeh, Egypt. Seeds presented by the director, Horticultural Section. Received March 25, 1921.

For experimental purposes.

52775. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

From Holguin, Cuba. Seeds presented by Thomas R. Towns. Received March 24, 1921.

"Pole beans that are common here in Cuba. Instead of being annuals, they are perennials and bear several crops during the year. They bear abundantly and are rich and mealy." (*Towns.*)

52776 to 52784. LINUM spp. Linaceæ. **Flax.**

From Montevideo, Uruguay. Seeds presented by Sr. Luis Guillot, Dirección General de Paseos Públicos. Received March 23, 1921.

52776. LINUM AFRICANUM L.

A species with opposite linear-lanceolate leaves and terminal pedunculate flowers. Native to South Africa.

52777. LINUM CORYMBIFERUM Desf.

A species with erect stems, 6 to 10 decimeters high, branching above into dichotomous, corymbose, filiform branchlets. The lanceolate, erect, scattered leaves are 13 to 35 millimeters long, and the yellow flowers are borne singly on short pedicels. Native to northwestern Africa. (Adapted from *Desfontaines, Flora Atlantica, vol. 1, p. 279.*)

52778. LINUM GRANDIFLORUM Desf.

A perennial Algerian plant, 30 to 40 centimeters high, with herbaceous stems from a shrubby base. The leaves are obovate-lanceolate to linear. The pink flowers, 3 centimeters long, are in forked cymes. (Adapted from *Muschler, Manual Flora of Egypt, vol. 1, p. 568.*)

52776 to 52784—Continued.

52779. LINUM NERVOSUM Waldst. and Kit.

A perennial herb with erect simple stems, branching at the apex. The sessile erect leaves are lanceolate and the large blue flowers are in panicles. Native to grassy forests near Pancsova, Hungary. (Adapted from *Waldstein, Descriptiones et Icones Plantarum Rariorum Hungariae, vol. 2, p. 109.*)

52780. LINUM PALLESCENS Bunge.

An erect, glabrous, pale glaucous perennial with linear, erect-spreading thickish leaves and pale-blue or white flowers. Native to Siberia. (Adapted from *Ledebour, Flora Altaica, vol. 1, p. 438.*)

52781 and 52782. LINUM USITATISSIMUM L.

52781. Received as *Linum monadelphum*, which is now generally referred to *L. usitatissimum.*

For previous introduction, see S. P. I. No. 50160.

52782. A form of the ordinary species of flax. Introduced for experimental work in cereal investigations.

For previous introduction, see S. P. I. No. 50160.

52783. LINUM sp.

Received as *Linum floccosum*, for which name a place of publication has not been found.

52784. LINUM sp.

Received as *Linum regale*, for which name a place of publication has not been found.

52785 and 52786. (CYAMOPSIS TETRAGONOLOBA (L.) Taub. Fabaceæ. (*C. psoraloides* DC.) **Guar.**

From Nagpur, Central Provinces, India. Seeds presented by D. Clouston, Director of Agriculture, Central Provinces. Received March 25, 1921. Quoted notes by Mr. Clouston.

"Two varieties generally cultivated about Nagpur."

52785. "*Deshi guar-phali.*" **52786.** "*Telia guar-phali.*"

52787. PERSEA SCHIEDEANA Nees. Lauraceæ. **Coyo.**

From San Jose, Costa Rica. Seeds presented by Mrs. Amparo Zeledón, through A. Alfaro, director, Museo Nacional. Received March 25, 1921.

This plant, known as *yas* in Costa Rica and *coyo* in Guatemala, is found from southern Mexico to Panama. In Costa Rica it grows abundantly on the slopes of Irazu at altitudes between 4,000 and 6,000 feet. Its fruits greatly resemble avocados in character.

Up to the present the *coyo* has not shown much promise in Florida or California. It is somewhat slow of growth and probably will not bear until the trees are at least 8 or 10 years old. Efforts are being made to obtain the best seedling varieties from Guatemala and to propagate them by grafting. In this way it will probably be possible to encourage early fruiting and to have fruit of better quality than would be obtained from most seedlings.

Extended data concerning this species and its cultural requirements will be found in United States Department of Agriculture Bulletin No. 743, "The Avocado in Guatemala."

52788 to 52795.

From Stockholm, Sweden. Seeds presented by Dr. Robert E. Fries, director, Hortus Botanicus Bergianus. Received March 25, 1921.

52788. ARALIA CACHEMIRICA Decaisne. Araliaceæ.

A lax shrub 5 to 10 feet high, with 1 to 3 pinnate leaves pilose above and glabrous or hispid on the veins beneath. The umbels are in elongated panicles a foot long. (Adapted from *Hooker, Flora of British India, vol. 2, p. 722.*)

For previous introduction, see S. P. I. No. 52669.

52789. CHENOPODIUM BONUS-HENRICUS L. Chenopodiaceæ.

Good King Henry.

An extremely hardy perennial, native to Europe, with a smooth, slightly channeled stem 2 to 3 feet high. The arrow-shaped, smooth dark-green leaves are frosty or mealy on the under surface and rather thick and fleshy. The small green flowers are in close compact clusters, and the small black seeds hold their viability for five years. The leaves are eaten like spinach and the shoots like asparagus as a very early vegetable blanched by simply earthing them up. These delicious shoots are abundant a fortnight before asparagus comes in and for some weeks afterwards. (Adapted from *Robinson, The Vegetable Garden, p. 313.*)

52790 to 52792. DATURA STRAMONIUM L. Solanaceæ.

52790. "Variety *inermis*. This is a recessive variety of *Datura stramonium*. It may be either white flowered or lavender flowered and is readily distinguished from the typical form in having capsules devoid of prickles." (*W. E. Safford.*)

52791. Received as *Datura leichhardtii*, but the seeds agree with those of *D. stramonium*.

52792. "Variety *tatula*. This variety is distinguished from the typical *Datura stramonium* by its lavender flowers and purple stem. The prickly pods are indistinguishable in form from those of the type. This is the dominant form of *D. stramonium*. The white-flowered type as well as the smooth-capsuled form usually called *D. inermis* are both recessive forms of the same species." (*W. E. Safford.*)

52793. DATURA sp. Solanaceæ.

Received as *Datura ekblomii*, for which name a place of publication has not been found.

52794. ELYMUS ARENARIUS L. Poaceæ. **Lyme-grass.**

A stout erect perennial 2 to 4 feet high, with extensively creeping rootstocks, rather firm, flat sharp-pointed leaves, and terminal, usually densely flowered spikes. Found in maritime sands of Greenland and Labrador to Maine, Alaska to California, and on the shores of the Great Lakes. This grass is one of the best species known for binding drifting sands, and in northern Europe it has been cultivated with beach-grass (*Ammophila arenaria*) for this purpose, the two species forming an admirable combination. The seeds are used for food by the Digger Indians of the Northwest. (Adapted from *United States Department of Agriculture, Division of Agrostology Bulletin No. 1, p. 307.*)

52788 to 52795—Continued.

52795. HEMEROCALLIS FULVA L. Liliaceæ.

The brown day lily, native to Asia, which is quite as pretty as the famous Orange lily and indeed makes a greater show. It makes half a dozen or more offsets every year, so that a large clump is soon formed. (Adapted from *Meehan's Monthly, vol. 5, p. 193.*)

52796. DIOSPYROS LOTUS L. Diospyraceæ.

From Yokohama, Japan. Seeds presented by the Yokohama Nursery Co. Received March 28, 1921.

Introduced for use as stocks.

For previous introduction and description, see S. P. I. No. 44535.

52797. CASSIA NODOSA Buch.-Ham. Cæsalpiniaceæ.

From Honolulu, Hawaii. Seeds presented by Dr. Harold L. Lyon, in charge, Department of Botany and Forestry. Received March 29, 1921.

A moderate-sized tree native to eastern Bengal and Malay Peninsula, very beautiful when bearing its profusion of bright-pink rose-scented flowers during May and June. The cylindric pods are 12 to 15 inches long. The tree is deciduous in dry weather. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting, p. 294.*)

52798. FLINDERSIA MACULOSA (Lindl.) F. Muell. Meliaceæ.

Leopard tree.

From Sydney, New South Wales, Australia. Seeds presented by George Valder, Director of Agriculture. Received March 20, 1921.

In the opinion of many experienced growers the leopard tree stands next in value to the *kurrajong* as a fodder tree. It grows from 30 to 45 feet high or more, and its trunk is curiously spotted, hence its popular name. From the trunk and larger branches exude large quantities of amber-colored gum of a pleasant flavor. The leopard tree is found growing over immense tracts of country in the interior of New South Wales. Its smaller branchlets have a somewhat pendulous habit which gives a well-grown specimen a decidedly ornamental appearance. During very dry periods this tree is cut down for stock feed, sheep being particularly fond of its leaves and thriving on them. The chemical analysis of the partially dried leopard-tree leaves gave the following results (in percentages): Water, 41.70; ash, 3.42; fiber, 11.43; albuminoids, 9.31; carbohydrates, 30.22. Nutrient value, 48.5; albuminoid ratio, 1 to 4.5.

The leopard tree is well worth conserving on those areas where it is already growing and planting in the driest districts for feeding to stock during prolonged droughts. Under ordinary conditions it produces quantities of seed, which when ripe and sown in the ordinary way germinates readily, so that there would be no difficulty in raising any number of plants. This tree also yields a serviceable timber of a bright-yellow color, nicely marked, close grained, and exceedingly tough and elastic. (Adapted from the *Pastoral Finance Association Magazine, vol. 5, No. 18, p. 33.*)

52799. CITRUS SINENSIS (L.) Osbeck. Rutaceæ. **Orange.**

From Jerusalem, Syria. Budwood presented by J. Ettinger, director, Agriculture and Colonization Department. Received March 31, 1921.

"Bud sticks of the Jaffa orange, *Shamooti*." (*Ettinger.*)

The Jaffa orange is one of the largest, larger even than the Washington Navel. Its form is obovate, its skin very thick, and its fruit seedless. The tree is not spiny, and the fruit, therefore, is never scarred by thorns. Its shipping qualities are excellent. (Adapted from *Aaronsohn, Agricultural and Botanical Explorations in Palestine, p. 26.*)

For previous introduction, see S. P. I. No. 51215.

52800 and 52801.

From Sydney, New South Wales, Australia. Seeds presented by George Valder, Director of Agriculture. Received March 31, 1921.

52800. ACACIA PENDULA A. Cunn. Mimosaceæ. **Wattle.**

"One of the most beautiful of all the Australian wattles is *Acacia pendula*, the *boree* of the aborigines, and generally known amongst stockmen as *myall* and *weeping myall*. It is a handsome evergreen tree, attaining sometimes a height of 35 feet, and occurring more or less abundantly over large areas in the interior. The lance-shaped silver-gray leaves (phyllodes) are 2 to 5 inches long; both sheep and cattle are so partial to them that one may travel for days in a country where these animals are pastured and rarely see a young tree, as the seedlings are eaten as soon as they are well above the ground. In very dry seasons the *myall* is often cut down and fed to sheep and cattle, and they seem to thrive on it. The chemical analysis of the partially dried leaves of this tree gave the following results, which show they are of good feeding value: Water, 48.45; ash, 4.45; fiber, 19.64; albuminoids, 9.62; carbohydrates, 16.63; nutrient value, 29.0; albuminoid ratio, 1 to 20.

"Since the horses do not eat the leaves, they may be allowed to graze in paddocks where the young myalls are growing. When allowed to grow undisturbed for a time the *myall* produces an abundance of seeds, which when mature retain their vitality for many years, and sometimes lie in the ground for a long period, indeed, until the weather and soil conditions are favorable for their germination. A well-grown specimen has a trunk about 3 feet in circumference and yields an excellent timber which is heavy, close in the grain, and of a rich dark-brown color and beautifully marked, having a delightful fragrance of violets, which it retains for a long time after being cut. In pre-war times the timber of this tree was used in Europe for veneering, for which it is well adapted; and before the country was settled the aborigines used it in the manufacture of their weapons." (*Pastoral Finance Association Magazine, vol. 5, No. 18, p. 131.*)

52801. GEIJERA PARVIFLORA Lindl. Rutaceæ.

"*Wilga.* From Nyngan, New South Wales." (*Valder.*)

A tall shrub or tree native to the interior of New South Wales, where it reaches a height of about 30 feet. It has slender pendulous branches, narrow leaves 3 to 6 inches long, and when well developed has a highly ornamental appearance, having something of the aspect of a weeping willow. It has remarkable drought-enduring qualities, and the leaves are often fed to sheep, which are very fond of them. (Adapted from the *Pastoral Finance Association Magazine, vol. 5, No. 18, p. 132.*)

For previous introduction, see S. P. I. No. 49892.

52802 and 52803.

From Burma. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received April 5, 1921.

52802. CORYPHA UMBRACULIFERA L. Phœnicaceæ. **Talipot palm.**

"*Talipot palm.* From Monywa, upper Chindwin River, Burma." *(Rock.)*

"The *talipot* palm is one of about five species belonging to the genus *Corypha*. It has a ringed trunk, generally remarkably straight and reaching a height of over 80 feet. Its leaves are of gigantic size, possibly the largest fan leaves of all palms. The petiole is 7 feet long and armed with spines on the margins. The blade is about 6 feet long and 16 feet broad with segments numbering from 95 to 100, and these are again bilobate. The flowers are white to cream colored and are borne in huge terminal panicles often 20 feet long. The palm flowers but once, after which it dies. The fruit is a roundish one-seeded drupe.

"This enormous palm is a native of Ceylon and the Malabar coast but is now cultivated in most tropical countries. The flowering time begins usually in the hot season, and the seeds ripen about 9 or 10 months afterwards. Each tree has a spread of about 200 square feet.

"The leaves of this palm are made into fans, mats, and umbrellas; the segments were used by the Cinghalese to write on. The sacred Pali texts of the Buddhist literature of Ceylon are all written on the leaf segments which are supposed to have withstood the ravages of ages.

"The seeds, which are like ivory, are employed in India for the manufacture of beads; they are sometimes colored red and sold as coral. The pith of the trunk yields a kind of sago; it is beaten to flour and baked into cakes." *(Rock, The Ornamental Trees of Hawaii, p. 19.)*

For an illustration of the talipot palm, see Plate VI.

52803. TARAKTOGENOS KURZII King. Flacourtiaceæ. **Chaulmoogra tree.**

"(True chaulmoogra from the upper Chindwin, January, 1921.) The bark of these trees is smooth and pale yellowish brown; the trunks are straight; the branches, which appear quite low down, are at right angles to the trunk but droop downward, giving the trees a pyramidal shape and the aspect of an old Abies, or fir. The fruits, which are perfectly round and not pointed at the apex, are the size of a large orange, of a light-fawn color and velvety tomentose. They are on short thickened peduncles and are borne on the ends of the flexible branches which become pendent, owing to the weight of the fruits." *(Rock.)*

For further information concerning this tree and allied species, see Rock, "The Chaulmoogra Tree and Some Related Species," United States Department of Agriculture Bulletin No. 1057, pp. 10–27.

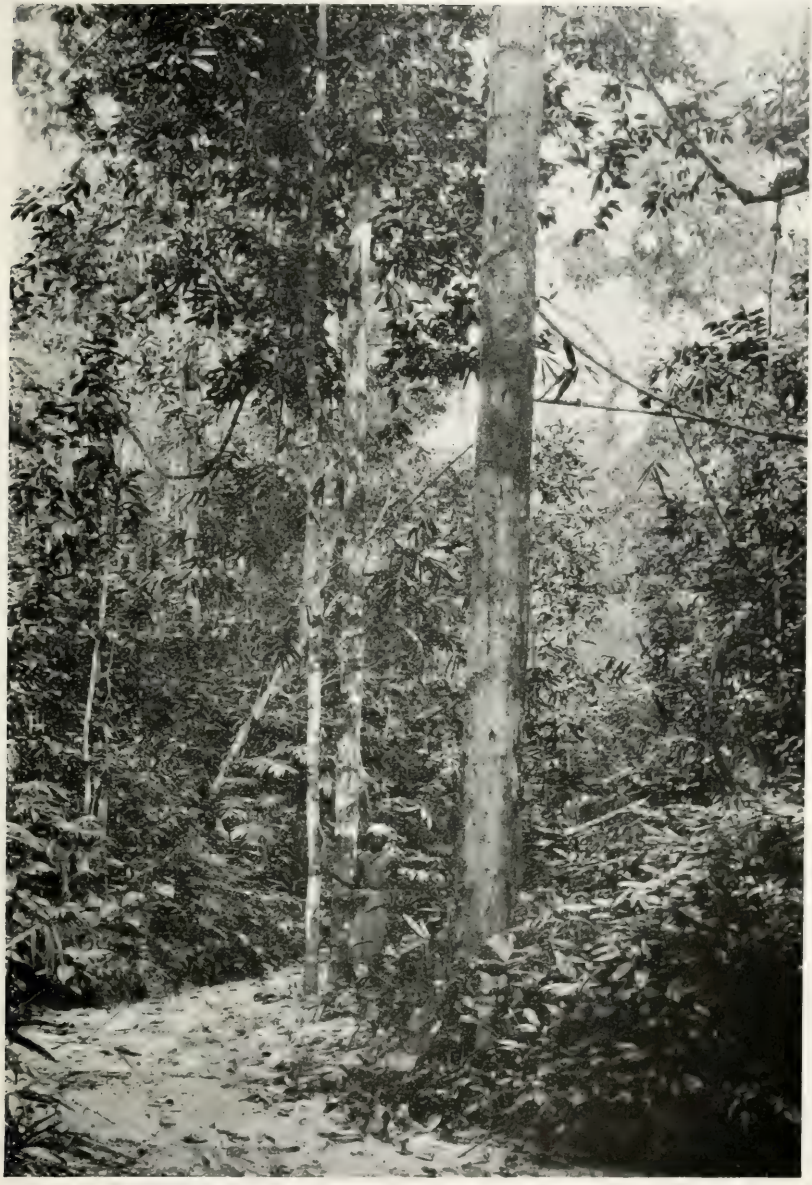
The chaulmoogra tree is illustrated in Plate VII, and its fruits are shown natural size in Plate VIII.

52804. CHAYOTA EDULIS Jacq. Cucurbitaceæ. **Chayote.**

(*Sechium edule* Swartz.)

From Guatemala. Fruit presented by Harry Johnson. Received March 17, 1921.

"These chayotes come from the damp, hot coastal region, near Lake Izabal. They may do well in Florida and not damp-off so badly in the rains." *(Johnson.)*



THE CHAULMOOGRA TREE OF BURMA. (TARAKTOGENOS KURZII KING, S. P. I. No. 52803.)

Doctors MacDonald and Dean, of Hawaii, consider it to be established that the fatty acids of the oil from the seeds of this tree are specific in leprosy, and it is certain that preparations of this oil have been of great help in the treatment of this dread disease. The trees near the native are chaulmoogra trees; the one in the foreground is an oak. (Photographed by J. F. Rock, near Khoung Khew, Upper Chindwin, Northwest Burma, January 20, 1921; P22773FS.)



FRUITS OF THE CHAULMOOGRA TREE. (TARAKTOGENOS KURZII KING, S. P. I. No. 52803.)

These fruits, shown here in natural size, are of a light fawn color. The oil is pressed cold from the kernels of the seeds after the seeds have been thoroughly washed, dried in the sun for one or two days, shelled, and the kernels crushed between corrugated-iron rollers. It is preparations of the ethyl esters of this oil that have been used so successfully in the treatment of leprosy. (Photographed by J. F. Rock, near Kyokta, Upper Chindwin, Burma, January, 1921; P22751FS.)

"The fruit is medium-sized, smooth, light green, appressed-pyriform, with scattered spines which are more prominent toward the fissure. Rust-colored irregular cracks appear in the skin. A cooking test of one of the two fruits received showed the chayote to be of good quality, the flesh tending toward the mealiness characteristic of the best Guatemalan types. The seed, however, is surrounded by a very tough fibrous seed coat from which extend into the flesh coarse fibers which render the removal of the flesh from the seed coat rather difficult." (*L. G. Hoover.*)

52805. PISUM SATIVUM L. Fabaceæ. **Garden pea.**

From Bussum, Netherlands. Seeds presented by Dr. J. C. Th. Uphof, plant breeder, Nederlandsche Élitezaad Maatschappij. Received March 23, 1921.

"*Mansholt kortstroo erwten* (Mansholt short-straw peas)." (*Uphof.*)

A variety introduced for experimental work.

52806 to 52809.

From Southern Rhodesia. Seeds presented by W. L. Thompson, American Board Mission. Received March 29, 1921. Quoted notes by Mr. Thompson.

52806. ANNONA SENEGALENSIS Pers. Annonaceæ.

"A really delicious fruit with a pronounced flavor."

For previous introduction, see S. P. I. No. 51903.

52807. CALLITRIS WHYTEI (Rendle) Engl. Pinaceæ.
(*Widdringtonia whytei* Rendle.)

"*Native cedar* of this region. These seeds are from trees in our own grounds."

The *Milanji cypress* was originally found at an altitude of 10,000 feet on Mount Milanji in Nyasaland by Alexander Whyte. It is a magnificent tree reaching a height of 140 feet, sometimes with a clear straight stem for 90 feet and a diameter of 5½ feet at 6 feet from the base. The pistillate cones, crowded four to six together on a short lateral shoot, are subglobose and about 1 inch wide when open. The staminate cones are solitary and terminal. The pale reddish timber is of excellent quality and easily worked. The bark on old trees is of great thickness, consisting of layers annually shed and renewed. These fine trees are rapidly disappearing before the forest fires, only those in damp gorges surviving. (Adapted from *Transactions of the Linnean Society, 2d ser., vol. 4, p. 60,* and from *Gardeners' Chronicle, 3d ser., vol. 37, p. 18.*)

52808. PARINARI CURTELLAEFOLIUM Planch. Rosaceæ.

"Seeds about the size of peach pits, from exceptionally large, fine fruits weighing 1½ ounces each. Many tons of fruit were produced in this region during the past season."

A small or medium-sized tree with elliptic-oblong scabrid leaves, glabrescent above, tomentose beneath, 2 to 5 inches long. The tomentose flower panicles are 3 to 6 inches long. The drupe, about the size of an ordinary plum, has a mealy, not unpleasant taste. Native to Mozambique and Upper Guinea. (Adapted from *Oliver, Flora of Tropical Africa, vol. 2, p. 368.*)

52809. (Undetermined.)

"Seeds of one of our large timber trees which is 3 to 4 feet in diameter and has cherrylike wood. The seeds are about the size and shape of acorns; the flavor of the kernel reminds one of raw potatoes."

52810 and 52811.

From Lourenco Marques, Mozambique. Seeds presented by John A. Ray, American consul, through Harry B. Shaw, New York City. Received February 19, 1921.

52810. CARICA PAPAYA L. Papayaceæ. **Papaya.**

A variety introduced for selection and breeding experiments.

52811. TRICHILIA EMETICA Vahl. Meliaceæ.

"*Mafurra.*" (*Ray.*)

A very beautiful shade tree 10 to 20 meters high, with a large round head and a blackish trunk. The seeds are the source of a vegetable fat which is used by the natives for greasing the skin. The fat consists of about 55 per cent oleic acid and 45 per cent palmitic acid and has been used in the manufacture of soap. Native to tropical Africa and Arabia. (Adapted from *Chiovenda, Etiopia, p. 88.*)

For previous introduction, see S. P. I. No. 51284.

52812 to 52815. GOSSYPIUM BARBADENSE L. Malvaceæ. **Cotton.**

From Gizeh, Mouderieh, Egypt. Seeds presented by the director, Botanical Section, Cairo Department of Agriculture. Received February 14, 1921.

The following varieties were presented for experimental work:

52812. *Ashmouni.*

52813. *Assili.*

52814. *Sakel.*

52815. *Zagora.*

52816. RUBUS sp. Rosaceæ. **Blackberry.**

From Bush Hill Park, Enfield, Middlesex, England. Plants presented by Stuart Low & Co., Royal Nurseries. Received March 7, 1921.

Lowberry. A variety said to bear sloe-black fruits the size of a Logan blackberry.

"This *lowberry* originated on the grounds of Stuart Low & Co. They said in a letter to me that it was sent them in a consignment of blackberries which came from the United States many years ago from some correspondent of whom they have no record. As the plants were seedlings, they were fruited out and this one retained and called the 'lowberry.' The fruit is of the appearance of the Logan blackberry." (*George M. Darrow.*)

52817. PINUS CANARIENSIS C. Smith. Pinaceæ. **Pine.**

From Santiago, Chile. Seeds presented by F. Albert, consulting forester, Forestry Department, through the United States Forest Service. Received March 5, 1921.

A pine native to the Canary Islands, which thrives in warm temperate climates and whose annual growth exceeds 1 meter in height and 1 centimeter in diameter. It is suited to all soils, from the seacoast to an altitude of 1,500 meters, has a straight trunk even when it grows in an isolated position, and its very thick bark prevents fire spreading from one tree to the other.

The wood of this pine, known in the Canary Islands as "tea," is very hard, very difficult to work, but unequaled for duration and building purposes because it does not rot. When buried it has the resistance of iron.

For some years large plantations of it have been established in South Africa and have done exceedingly well. Excellent results have also been obtained in Chile. (Adapted from *Bulletin de la Société Nationale d'Acclimatation de France, vol. 64, p. 322.*)

For previous introduction, see S. P. I. No. 10710.

52818 to 52834.

From Groningen, Netherlands. Seeds presented by C. Broekema, director, Groninger Zaaizaadvereeniging. Received March 29, 1921. Quoted notes by Mr. Broekema. Other notes adapted from *Groninger Zaaizaadvereeniging, January 5, 1921.*

52818 to 52822. AVENA SATIVA L. Poaceæ. Oats.

52818. "*Gouden regen* (golden drop)."

Svalofs gouden regen. The grain is intense yellow and has a very high weight per hectoliter. In some sandy districts this variety is chosen above all others because it succeeds on poor soil.

52819. "*Mansholt I.*"

This variety was obtained by Dr. Mansholt from a natural cross of *Deensche reuzenhaver* (Danish giant oat). It makes a vigorous growth which sometimes lodges on very rich soil, but it is to be recommended for fertile sandy soils. The grain is yellow, heavier than that of *Gouden regen*, but the weight per hectoliter is not as high. The husk is very thin.

52820. "*Mansholt II B.*"

A variety introduced into the trade in 1912, which, because of its excellent properties has been extensively grown. The straw is fairly stiff, and the yield in long slender grain is very good. In the better soils it has become a competitor of the *zegehaver.*

52821. "*Zegehaver* (Triumphal)."

52822. "*Zwarte President* (Black President)."

This variety has straw which is medium long and weak. The yield on light soils is very good, but on heavy soil the yield is below that of most of the white varieties. Its soil requirements are few, and it ripens very early. The husk is thin, so that it is a first-class feeding oat.

52823 to 52825. HORDEUM DISTICHON PALMELLA Harlan. Poaceæ. Barley.

52823. "*Chevalier* (Chevalier, spring variety)."

A variety with a long narrow well-filled head. The grain yield is good and the weight per hectoliter is very high.

For previous introduction, see S. P. I. No. 5842.

52824. "*Goud* (golden)."

Svalofs goud. A variety with short, thin but strong straw, and small, full, somewhat yellow grain. It is preferred above other varieties by many growers and is extensively cultivated.

52825. [No label.]

52826 and 52827. LINUM USITATISSIMUM L. Linaceæ. Flax.

52826. "*Blawbloeilynzaad.*"

Blue-flowered flax, the original seeds of which were imported from Russia.

52827. "*Witbloeilynzaad.*"

White-flowered flax. In the better flax districts this white-flowered variety has been increasingly cultivated during the last few years because it gives high yields of seeds and fiber. This form can better withstand unfavorable weather and is less particular about soil conditions.

52818 to 52834—Continued.

52828 and 52829. PISUM SATIVUM L. Fabaceæ. **Garden pea.**

52828. "Hand-picked peas."

52829. "*Mansholt kortstroo erwten* (Mansholt short-straw peas)."

52830. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.**
(*T. vulgare* Vill.)

"*Japhet zomertarwe* (Japhet summer wheat)."

For previous introduction, see S. P. I. No. 44949.

52831 to 52834. VICIA FABA L. Fabaceæ. **Broad bean.**

52831. "*Gelezen wierboonen* (wier beans, hand picked)."

A variety smaller than the *waalsche boon*, and satisfactory on less fertile soils, where it gives good yields.

52832. "*Paardeboon* (horse beans)."

This variety thrives in all kinds of soils from the heaviest clay to the lightest sandy soils. In rich soils it may grow too much to leaves so that the yield is decreased.

52833. "*Tuinboon* (garden beans)."

A variety generally known and cultivated as the broad bean which is in the trade in Groningen. The yield is usually very good, up to 50 hectoliters per hectare. It requires, however, a fairly fertile, medium-heavy soil. When picked green it is a very nutritious and tasteful vegetable.

52834. "*Witkiem* (white-germ beans)."

52835 to 52840.

From Bussum, Netherlands. Seeds presented by J. C. Th. Uphof, plant breeder, Nederlandsche Élitezaad Maatschappij. Received March 23, 1921. Quoted notes by Mr. Uphof. Other notes adapted from *Groninger Zaaizaadvereeniging, January 5, 1921.*

52835. AVENA SATIVA L. Poaceæ. **Oats.**

"*Zegehaver.*"

This variety, *Svalofs-Zegehaver*, has replaced nearly all the white varieties formerly cultivated in Groningen, it produces an abundance of long straw which withstands lodging, and large grain, and has a large weight per hectoliter. This variety thrives best in fairly rich soil.

52836 and 52837. BETA VULGARIS L. Chenopodiaceæ. **Beet.**

52836. "*Mangelwurzel-Barres.*"

Barres van Sludstrup. First and second crops from seed of a variety imported from Denmark. The yield of reddish brown medium-long beets is very high.

52837. "Sugar beet, improved by the Netherlands Élite Seed Co."

52838 and 52839. HORDEUM DISTICHON PALMELLA Harlan. Poaceæ. **Barley.**

52838. "*Chevalier.*"

For previous introductions, see S. P. I. No. 5842.

52839. "*Princesse.*"

Svalofs Princessegerst. A variety with medium-long and very leafy straw, full grain, and very wrinkled husk. The yield is very good.

52840. HORDEUM VULGARE PALLIDUM Seringe. Poaceæ. **Barley.**

"*Oldambtster wintergerst* (Oldambtster winter barley)."

52841. MELICOCCA BIJUGA L. Sapindaceæ. **Genip.**

From Nassau, New Providence, Bahamas. Plants presented by Neville D. Sands, secretary, Board of Agriculture. Received February 21, 1921.

"A dicœcious tree common in the West Indies and sometimes called 'Spanish lime.' It reaches 20 to 25 feet in height and has light-green compound leaves, with clusters of small white flowers in early spring. The fruit, which ripens in August, has a brittle shell covering the acid edible pulp which incloses the large seed." (*Sands.*)

"One of the local names of this tree is 'honeyberry.' It is cultivated for its edible fruit in the West Indies, Brazil, and Paraguay. The seeds are rich in starch and are used as we use the chestnut in the United States." (*W. W. Stockberger.*)

For previous introduction, see S. P. I. No. 44883.

52842 to 52844. TRITICUM AESTIVUM L. Poaceæ.
(*T. vulgare* Vill.) **Common wheat.**

From Bussum, Netherlands. Seeds presented by J. C. Th. Uphof, plant breeder, Nederlandsche Élitezaad Maatschappij. Received March 23, 1921. Quoted notes by Mr. Uphof. Other notes adapted from *Groninger Zaaizaadvereeniging, January 5, 1921.*

52842. "*Imperiaal.*"

A new variety from the Instituut voor veredeling van landbouwgewassen (Institute for improvement of agricultural crops). (*Groninger Zaaizaadvereeniging, Aug. 22, 1919.*)

52843. "*Japhet zomertarwe* (Japhet summer wheat)."

A variety with stiff straw, red grain, and white chaff. Of all varieties of summer wheat this has proved the best so that it has nearly replaced all other varieties. In Groningen it is used nearly as much for summer as for winter wheat. On many soils it gives approximately nearly as high yield as winter wheat. The soil requirements are similar to those of oats. The seeds require early sowing and must be treated with formalin before sowing.

52844. "*Millioen* (Million)."

52845 to 52848. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From Groningen, Netherlands. Tubers presented by C. Broekema, director, Groninger Zaaizaadvereeniging. Received March 31, 1921. Quoted notes by Mr. Broekema.

52845. "*Bravo.* Grown by Mr. Veenhuigen, and known as an excellent winter potato in which very few black ones are present after storage. The yield is up to 400 hectoliters per hectare."

52846. "*Eigenheimer.* A very good potato which grows in clay and sandy soils."

An early yellow-fleshed variety good for table use and resistant to Phytophthora.

For previous introduction, see S. P. I. No. 12597.

52847. "*Groningen Kron.* An extraordinarily good potato of high yield, recommended for winter storage. Originated by Mr. Velhuis at Oosterhoogebrug."

52848. "*Roode Star.* A well-known potato, but more susceptible to diseases than *Groningen Kron* and *Bravo*, which are not so well known."

52849 to 52851.

From Yokohama, Japan. Seeds purchased from the Yokohama Nursery Co. Received March 28, 1921.

52849. AMYGDALUS DAVIDIANA (Carr.) Zabel. Amygdalaceæ. (*Prunus davidiana* Franch.)

For stock experiments.

For previous introduction and description, see S. P. I. No. 36807.

52850. DIOSPYROS LOTUS L. Diospyraceæ.

For stock experiments.

For previous introduction and description, see S. P. I. No. 44535.

52851. PYRUS USSURIENSIS Maxim. Malaceæ. **Pear.**

For stock experiments.

For previous introduction and description, see S. P. I. No. 47301.

52852 and 52853. RUBUS IDAEUS L. Rosaceæ. **European raspberry.**

From Wimborne, England. Plants presented by J. J. Kettle, Corfe Mullen. Received March 11, 1921.

52852. "*Perfection.*" (*Kettle.*)

52853. "*Lloyd George Perpetual.*" (*Kettle.*)

52854. COCOS NUCIFERA L. Phœnicaceæ. **Coconut.**

From Buitenzorg, Java. Seeds presented by Dr. I. Boldingh, acting head of the Division of Plant Breeding, Java Department of Agriculture. Received March 29, 1921.

"*Klappa-guding.*" (Boldingh.)

INDEX OF COMMON AND SCIENTIFIC NAMES.

Abies faxoniana, 52622.
recurvata, 52624.
sibirica nephrolepis, 52623.
Acacia sp., 52333.
pendula, 52800.
tortilis, 52619.
Adonis vernalis, 52495.
Aesculus indica, 52625.
Aextoxicon punctatum, 52586.
Agati grandiflora, 52307.
Aleurites moluccana, 52449, 52755.
triloba. See *A. moluccana*.
Alfalfa, *Medicago sativa*, 52612.
Allium ascalonicum, 52310.
cepa, 52311.
fistulosum, 52312–52314.
Amygdalus davidiana, 52604, 52662, 52849.
persica, 52339, 52340.
Anacardium occidentale, 52581, 52582.
Ananas sativus, 52492.
Andropogon minarum, 52741.
Annona cherimola, 52375.
reticulata, 52745.
senegalensis, 52806.
Apple. See *Malus* spp.
Apricot, *Prunus armeniaca*, 52578, 52739.
Arachis hypogaea, 52343, 52344.
Aralia cachemirica, 52669, 52788.
Arbol de la Cruz, *Brownea grandiceps*, 52308.
Arundinaria auricoma, 52670.
fastuosa, 52671.
fortunei, 52672.
pumila, 52673.
pygmaea, 52674.
Arundo mauritanica. See *A. plinii*.
plinii, 52566.
Astragalus sp., 52617.
Athel, *Tamarix aphylla*, 52534.
Avena sativa, 52515, 52516, 52818–52822, 52835.
Avicennia officinalis, 52754.
Babaco, *Carica* spp., 52574, 52721.
Bamboo, *Arundinaria* spp., 52670–52674.
Phyllostachys flexuosa, 52686.
Banana, *Musa* sp., 52571.
Barberry. See *Berberis* spp.
Barley. See *Hordeum* spp.
Bauhinia, sp., 52747.
malabarica, 52746.
Bean, bonavist, *Dolichos lablab*, 52363.
broad, *Vicia faba*, 52744, 52831–52834.
Lima, *Phaseolus lunatus*, 52775.
soy, *Soja max*, 52345–52349.
Beet, *Beta vulgaris*, 52836, 52837.
Berberis spp., 52626–52628.
aggregata, 52454.
brachypoda, 52453.
brevipaniculata, 52336.
Berry, Andes, *Rubus glaucus*, 52717, 52733, 52734.
Beta vulgaris, 52836, 52837.
Blackberry, *Rubus* spp., 52773, 52816.
Bombax insigne, 52748.
Bor, *Ziziphus mauritiana*, 52417.
Boree, *Acacia pendula*, 52800.
Brassica oleracea botrytis, 52602.
Brownea grandiceps, 52308.
Buddleia davidii, 52675.
variabilis. See *B. davidii*.
Bullock's-heart. See Custard-apple.
Bunchosia armeniaca, 52715.
Byrsonima crassifolia, 52530.

Caesalpinia pectinata, 52587.
tinctoria. See *C. pectinata*.
Caldcluvia paniculata, 52588.
Callitris whytei, 52807.
Calophyllum inophyllum, 52595.
Canarium rufum, 52399.
Canavali obtusifolium, 52400.
Capulin, *Prunus serotina*, 52579, 52720.

Caragana sp., 52700.
arborescens, 52451, 52690, 52691.
cuneifolia, 52692.
boisi, 52452, 52629.
frutex, 52693–52695.
grandiflora, 52696.
microphylla, 52697.
pygmaea, 52698.
sibirica, 52699.
Carica spp., 52309, 52574, 52716, 52721.
papaya, 52620, 52810.
Cashew, *Anacardium occidentale*, 52581, 52582.
Cassia eremophila, 52353.
grandis, 52401.
nodosa, 52797.
occidentalis, 52599.
Castanea diversifolia, 52387, 52436.
Castanopsis argentea, 52533.
Cauliflower, *Brassica oleracea botrytis*, 52602.
Chamburo, *Carica* sp., 52716.
Chaulmoogra tree, *Taraktogenos kurzii*, 52803.
Chayota edulis, 52467, 52804.
Chayote, *Chayota edulis*, 52467, 52804.
Chenopodium bonus-henricus, 52789.
Cherimoya, *Annona cherimola*, 52375.
Cherry, flowering, *Prunus serrulata*, 52663.
Chivo, *Duranta triacantha*, 52575, 52610.
Chipilín, *Crotalaria striata*, 52531.
Cholán, *Delostoma roseum*, 52608, 52609.
Ciruela verde, *Bunchosia armeniaca*, 52715.
Citrus decumana. See *C. grandis*.
grandis, 52388, 52389.
sinensis, 52799.
Clematis buchaniana, 52676.
montana rubens, 52630.
tangutica, 52631.
obtusiuscula, 52337.
Clover, cluster, *Trifolium glomeratum*, 52356.
red, *Trifolium pratense*, 52601.
subterranean, *Trifolium subterraneum*, 52335.
Cochlospermum hibiscoides. See *Maximilianea vitifolia*.
Coconut, *Cocos nucifera*, 52854.
Cocos nucifera, 52854.
Coigüe, *Nothofagus dombeyi*, 52592.
Colocasia esculenta, 52332.
Corn, *Zea mays:*
Maiz negro, 52616.
amarillo, 52719.
Morocho blanco, 52718.
Cornus walteri, 52702.
Corylus avellana, 52354, 52355.
Corypha umbraculifera, 52802.
Cotoneaster spp., 52632–52639.
dammeri radicans, 52677.
Cotton, *Gossypium* sp., 52438.
Gossypium barbadense:
Ashmouni, 52812.
Assili, 52813.
Sakel, 52814.
Zagora, 52815.
tree, *Bombax insigne*, 52748.
Gossypium arboreum, 52384.
Coyo, *Persea schiedeana*, 52787.
Crab apple, *Malus sikkimensis*, 52684.
Crataegus azarolus, 52362.
crenulata. See *Pyracantha crenulata*.
Crotalaria striata, 52531.
Cuperi algaroba, *Prosopis* sp., 52505.
Currant, *Ribes* spp., 52707–52711.
Currebau-sevil, *Piptadenia cebil*, 52504.
Custard-apple, *Annona reticulata*, 52745.
Cyamopsis psoraloides. See *C. tetragonoloba*.
tetragonoloba, 52785, 52786.
Cycas sp., 52402.
Cyphomandra betacea, 52740.
Cypress, Milanji, *Callitris whytei*, 52807.

Datura sp., 52793.
innoxia, 52584, 52585.
metel, 52330, 52422–52424.
sanguinea, 52607, 52735.
stramonium, 52790–52792.
Davidsonia pruriens, 52352.
Delostoma roseum, 52608, 52609.
Deutzia spp., 52455, 52641, 52642.
discolor, 52678.
schneideriana laxiflora, 52640.
Digitaria exilis, 52736.
Dioscorea alata, 52507.
Diospyros ebenaster, 52377.
lotus, 52796, 52850.
mollis, 52510.
Dolichos lablab, 52363.
Duranta triacantha, 52575, 52610.

Echium violaceum, 52357.
Elaeocarpus sp., 52403.
siamensis, 52437.
Elymus arenarius, 52794.
Eriogonum wrightii subscaposum, 52509.
Eucryphia cordifolia, 52589.
Eugenia uniflora, 52569.
Euphorbia sp., 52398.
Euterpe sp., 52331.

Fagus dombeyi. See *Nothofagus dombeyi*.
obliqua. See *Nothofagus obliqua*.
procera. See *Nothofagus procera*.
Ficus spp., 52404–52410.
carica, 52598.
glomerata, 52496.
Fig. See *Ficus* spp.
Filbert, *Corylus avellana:*
Précoce de Frauendorf, 52354.
Princesse royale, 52355.
Fir. See *Abies* spp.
Flacourtia indica, 52411.
ramontchi. See *F. indica*.
Flax. See *Linum* spp.
Flindersia maculosa, 52798.
Flor morado, *Echium violaceum*, 52357.
Forsythia sp., 52643.
Fragaria spp., 52758–52762.
chiloensis, 52576, 52731.
daltoniana, 52679.
moschata, 52756.
nilgerrensis, 52680.
vesca, 52757.

Geijera parviflora, 52801.
Genip, *Melicocca bijuga*, 52841.
Glycine hispida. See *Soja max*.
Good King Henry, *Chenopodium bonus-henricus*, 52789.
Gooseberry, *Ribes cynosbati*, 52706.
Gossypium sp., 52438.
arboreum, 52384.
barbadense, 52812–52815.
Grass, beard, *Andropogon minarum*, 52741.
fundi, *Digitaria exilis*, 52736.
lyme, *Elymus arenarius*, 52794.
mission, *Pennisetum setosum*, 52743.
molasses, *Melinis minutiflora*, 52742.
plume, *Miscanthus condensatus*, 52383.
timothy, *Phleum pratense*, 52666.
Guar, *Cyamopsis tetragonoloba*, 52785, 52786.

Hawthorn, *Crataegus azarolus*, 52362.
Hemerocallis fulva, 52795.
Holcus halepensis × *sorghum*, 52338.
sorghum, 52425, 52426, 52606.
Hordeum distichon palmella, 52618, 52823–52825, 52838, 52839.
vulgare pallidum, 52517–52519, 52840.
Hydnocarpus anthelminthica, 52465, 52468.
castanea, 52514.
Hydrangea sp., 52703.

Ilex fargesii, 52644.
Inga laurina, 52511.
Ipomoea carnea, 52493.
horsfalliae, 52749.
Irvingia malayana, 52494.

Juglans spp., 52611, 52682, 52683.
intermedia vilmoreana, 52681.
Juniper, *Juniperus thurifera*, 52378.
Juniperus thurifera, 52378.

Kennedia rubicunda, 52367.
Keurboom, *Virgilia capensis*, 52376.

Lagerstroemia spp., 52512, 52750.
Landolphia kirkii, 52583.
Laurel, Alexandrian, *Calophyllum inophyllum*, 52595.
Chilean, *Laurelia sempervirens*, 52590.
Laurelia aromatica. See *L. sempervirens*.
sempervirens, 52590.
Lavandula spica, 52645, 52646.
Lavender, *Lavandula spica*, 52645, 52646.
Leopard tree, *Flindersia maculosa*, 52798.
Lilac, *Syringa chinensis*, 52713.
Linum spp., 52783, 52784.
africanum, 52776.
alpinum, 52358.
austriacum, 52380.
corymbiferum, 52777.
flavum, 52369, 52381.
grandiflorum, 52359, 52370, 52778.
monogynum, 52364, 52371.
muelleri, 52360.
nervosum, 52779.
pallescens, 52780.

Linum perenne, 52372.
tenuifolium, 52373.
usitatissimum, 52361, 52365, 52366, 52374, 52382, 52774, 52781, 52782, 52826, 52827.
Litchi chinensis, 52701.
Livistona sp., 52466.
Lomatia obliqua. See *Tricondylus obliqua*.
Lonicera sp., 52704.
Lowberry, *Rubus* sp., 52816.
Lumbang, *Aleurites moluccana*, 52449, 52755.
Lupine, white, *Lupinus albus*, 52752.
yellow, *Lupinus luteus*, 52753.
Lupinus albus, 52752.
luteus, 52753.
Lychee, *Litchi chinensis*, 52701.
Lycopersicon esculentum, 52334, 52577.

Mafurra, *Trichilia emetica*, 52811.
Maikrabao, *Hydnocarpus anthelmintica*, 52465, 52468.
Mai khai, *Euphorbia* sp., 52398.
Mai padou, *Pterocarpus macrocarpus*, 52390.
Malus laosensis, 52341.
sikkimensis, 52684.
sylvestris, 52392, 52647, 52667.
Mangifera indica, 52668.
Mango, Pirie, *Mangifera indica*, 52668.
Mangrove, white, *Avicennia officinalis*, 52754.
Maximilianea vitifolia, 52412.
Maiten, *Maytenus boaria*, 52591.
Maytenus boaria, 52591.
Medicago sativa, 52612.
Melicocca bijuga, 52841.
Melinis minutiflora, 52742.
Mimusops sp., 52413.
Mirabel, *Prunus cerasifera myrobalana*, 52580, 52615.
Miscanthus condensatus, 52383.
Mock orange, *Philadelphus* spp:
Chinese, *Philadelphus sericanthus*, 52457.
common, *Philadelphus grandiflorus*, 52456.
hybrid, *Philadelphus lemoinei*, 52649–52657.
Avalanche, 52649.
Bannierii, 52650.
Bouquet blanc, 52651.
Boule d'Argent, 52652.
Mock orange—Continued.
hybrid—Continued.
Candelabra, 52653.
Erectus, 52654.
Manteau d'Hermine, 52655.
Mont Blanc, 52656.
Oeil de pourpre, 52657.
Momordica cochinchinensis, 52497.
Mora de Castilla, *Rubus glaucus*, 52717, 52733, 52734.
Morning-glory. See *Ipomoea* spp.
Mucuna sp., 52414.
Muermo, *Eucryphia cordifolia*, 52589.
Musa sp., 52571.
Myall, *Acacia pendula*, 52800.

Nance, *Byrsonima crassifolia*, 52530.
Nephelium litchi. See *Litchi chinensis*.
Nothofagus dombeyi, 52592.
obliqua, 52593.
procera, 52594.

Oak. See *Quercus* spp.
Oats, *Avena sativa*, 52515, 52516, 52818–52822, 52835.
Onion, *Allium cepa*, 52311.
Welsh, *Allium fistulosum*, 52312–52314.
Orange, Jaffa, *Citrus sinensis*, 52799.
Oryza sativa, 52439, 52751.
Osmanthus delavayi, 52685.

Paeonia lutea, 52648.
Palm, assahy, *Euterpe* sp., 52331.
fan, *Livistona* sp., 52466.
talipot, *Corypha umbraculifera*, 52802.
Papaya, *Carica papaya*, 52620, 52810.
Parinari sp., 52415.
curtellaefolium, 52808.
Pea, garden, *Pisum sativum*, 52805, 52828, 52829.
Peach, *Amygdalus persica*, 52339, 52340.
Peanut, *Arachis hypogaea*, 52343, 52344.
Pear. See *Pyrus* spp.
Pea tree, Siberian, *Caragana* sp. 52451, 52690–52692.
Pennisetum setosum, 52743.
Peony, *Paeonia lutea*, 52648.
Pepper, *Piper* sp., 52572.

Persea schiedeana, 52787.
Phaseolus lunatus, 52775.
Philadelphus grandiflorus, 52456.
lemoinei, 52649–52657.
sericanthus, 52457.
Phlesia magellanica, 52596.
Phleum pratense, 52666.
Phyllostachys flexuosa, 52686.
Picea jezoensis, 52658.
schrenkiana, 52659.
Pine, *Pinus canariensis*, 52817.
Pineapple, *Ananas sativus*, 52492.
Pinus canariensis, 52817.
Piper sp., 52572.
Piptadenia cebil, 52504.
Pisum sativum, 52805, 52828, 52829.
Pitanga, *Eugenia uniflora*, 52569.
Plum, Mirabel, *Prunus cerasifera myrobalana*, 52580, 52615.
Poplar. See *Populus* spp.
Populus alba subintegerrima, 52605.
euphratica, 52368.
rasumowskiana, 52705.
Potato, *Solanum tuberosum:*
Bravo, 52845.
Calvache, 52722.
(Colombia), 52315–52317.
Dominga, 52723.
Eigenheimer, 52846.
Groningen Kron, 52847.
Huagrasinga, 52724.
Inglesa, 52725.
Leona, 52726.
Pazmina, 52727.
Manzana, 52728.
(Netherlands), 52520–52522.
Papa criolla, 52316, 52317.
Roode Star, 52848.
Tabla, 52729.
Yungara, 52730.
Prosopis sp., 52505.
Prunus armeniaca, 52578, 52739.
cerasifera myrobalana, 52580, 52615.
davidiana. See *Amygdalus davidiana*.
persica. See *Amygdalus persica*.
serotina, 52579, 52614, 52720.
serrulata, 52663.
Pterocarpus macrocarpus, 52390.
Pummelo, *Citrus grandis:*
Ban Kun Non, 52388.
Nakon Chaisri, 52388.
Thong Dee, 52389.
Pyracantha crenulata, 52687.
Pyrus spp., 52461–52464, 52688.
communis, 52732.
× *lindleyi*, 52567.
malus. See *Malus sylvestris*.
pashia, 52342.
sikkimensis. See *Malus sikkimensis*.
trilobata. See *Sorbus trilobata*.
ussuriensis, 52568, 52851.

Quercus spp., 52442, 52448.
fenestrata, 52444.
ilex, 52506.
junghuhnii, 52440, 52441.
kerrii, 52447.
lindleyana, 52393, 52394.
polystachya, 52395, 52443.
sootepensis, 52396.
thomsoni, 52397, 52445, 52446.
truncata, 52391.

Radal, *Tricondylus obliqua*, 52597.
Radish, *Raphanus sativus*, 52508.
Ramontchi, *Flacourtia indica*, 52411.
Raphanus sativus, 52508.
Raspberry, European, *Rubus idaeus*:
Abundance, 52763.
Baumforth, 52764.
Bountiful, 52765.
Devon, 52766.
Hornet, 52767.
Lloyd George Perpetual, 52853.
Magnum Bonum, 52768.
Merveille de Rouge, 52769.
Norwich Wonder, 52770.
October Red, 52771.
Park Lane, 52490.
Perfection, 52852.
Pyne's Royal, 52491.
Semper Fidelis, 52772.
Rauli, *Nothofagus procera*, 52594.
Regenerador, *Agati grandiflora*, 52307.
Rhododendron chartophyllum, 52460.
racemosum, 52603, 52621.
Ribes cynosbati, 52706.
longeracemosum, 52707.
petraeum, 52708.
caucasicum, 52709.
ussuriense, 52710.
vilmorini, 52711.
Rice, *Oryza sativa*, 52439, 52751.
Roble, *Nothofagus obliqua*, 52593.
Rosa beggeriana, 52458.
Rose, *Rosa beggeriana*, 52458.

Rubus spp., 52660, 52661, 52773, 52816.
glaucus, 52717, 52733, 52734.
idaeus, 52490, 52491, 52763–52772, 52852, 52853.

Saccharum officinarum, 52350, 52351, 52427–52435, 52469–52489, 52535–53545, 52664, 52665.
Sapote, black, *Diospyros ebenaster*, 52377.
Sechium edule. See *Chayota edulis*.
Sesbania grandiflora. See *Agati grandiflora*.
Shallot, *Allium ascalonicum*, 52310.
Sindora sp., 52513.
Soja max, 52345–52349.
Solanum mammosum, 52385.
tuberosum, 52315–52317, 52520–52522, 52722–52730, 52845–52848.
Sorbus trilobata, 52600.
Sorghum, *Holcus halepensis*×*sorghum*, 52338.
Holcus sorghum, 52425, 52426, 52606.
Sorghum vulgare. See *Holcus sorghum*.
Spelt, *Triticum spelta:*
Abdessalem, 52546.
Ali ben Maklouf, 52550.
Bhamoud, 52547, 52548.
El Harcha, 52549.
Lebbaga, 52551.
Masraf, 52552.
Spiraea myrtilloides, 52459, 52712.
Spirea, *Spiraea myrtilloides*, **52459**, 52712.
Spruce. See *Picea* spp.
Stachys sieboldi, 52306, 52379.
Sterculia sp., 52416.
Strawberry, *Fragaria* spp.:
Chilean, Ambato, 52576, 52731.
garden, International, 52758.
King George V., 52759.
La Perle, 52760.
Maincrop, 52761.
White Perpetual, 52762.
hautbois, Royal, 52756.
Himalayan, 52679.
Nilghiri, 52680.
wood, Red Alpine, 52757.
Sugar cane, *Saccharum officinarum*:
Christal, 52427.
D–74. 52428–52430.
Demerara 109, 52351.
Sugar cane—Continued.
Demerara 433. 52350.
Florida Green, 52431.
H 10.028, 52538.
H 11.027, 52469.
H 11.050, 52470.
H 15, 52471.
H 144, 52472.
H 219, 52473.
H 289, 52474.
H 598, 52475.
H 1304, 52540.
H 1418, 52476, 52541.
H 1419. 52542.
H. 4121, 52478, 52543.
H 4124, 52479, 52535.
H 6047, 52480.
H 6112, 52481.
H 6113, 52482.
H 6241, 52483, 52536.
H 6142, 52484.
H 6286, 52485.
H 6296, 52486, 52537.
H 9029, 52544.
H 9050, 52487.
H 9092, 52488, 52545.
H 9176, 52489.
J 213, 52664.
Java 51, 52539.
Kassoer, 52665.
Kavangire, 52433.
P. R. 260, 52434.
P. R. 292, 52435.
Syringa chinensis, 52713.

Tacsonia tripartita, 52613.
Taiwania cryptomerioides, 52570.
Tamarix aphylla, 52534.
articulata. See *T. aphylla*.
Tara, *Caesalpinia pectinata*, 52587.
Taraktogenos kurzii, 52803.
Taro, *Colocasia esculenta*, 52332.
Telfairia pedata, 52450.
Thespesia lampas, 52386.
Tiaca, *Caldcluvia paniculata*, 52588.
Timothy, *Phleum pratense*, 52666.
Tique, *Aextoxicon punctatum*, 52586.
Tocte, *Juglans* sp., 52611.
Tomato, *Lycopersicon esculentum*, 52334, 52577.
Tree-tomato, *Cyphomandra betacea*, 52740.
Triaca, *Caldcluvia paniculata*, 52588.
Trichilia emetica, 52811.

Tricondylus obliqua, 52597.
Trifolium glomeratum, 52356.
pratense, 52601.
subterraneum, 52335.
Triticum aestivum, 52318–52327, 52498–52502, 52523–52529, 52553–52565, 52737, 52738, 52830, 52842–52844.
spelta, 52546–52552.
turgidum, 52328, 52329, 52503.
vulgare. See *T. aestivum*.

Undetermined, 52418–52421, 52573, 52809.

Viburnum sp., 52714.
sieboldii, 52689.
Vicia faba, 52744, 52831–52834.
Virgilia capensis, 52376.

Walnut. See *Juglans* spp.
Wattle, *Acacia* spp., 52333, 52800.
Wheat, *Triticum aestivum:*
common, Addens, 52523.
Bahtane, 52553.
Baroudi, 52554.
Benefactor, 52318.
Blé de Chine No. 1, 52737.
Blé de Chine No. 2, 52738.
Essex Conqueror, 52319.
Diekhuis I, 52524.
El Moumena, 52555.
Ferek, 52556.
Hard Federation Selections, 52557–52565.
Iduma Red, 52320.
Imperiaal, 52842.
Wheat, *Triticum aestivum*—Continued.
common Japhet zomertarwe, 52830, 52843.
Improved Double Stand-Up White, 52321.
John Bull, 52322.
Little Joss, 52323.
Marshal Foch, 52324.
Millioen, 52844.
Millioen III, 52525.
Pantso, 52526.
Reselected Victor White, 52325.
Snowdrop White, 52326.
White Marvel, 52327.
Wieb, 52527.
W. & E. P., 52528.
W. & W. D. 14, 52529.
Yeoman C., 52498.
Yeoman F., 52499.
Yeoman H., 52500.
Yeoman S., 52501.
Yeoman Y., 52502.
poulard, *Triticum turgidum:*
Early Red Cone, 52329.
Hati, 52503.
Percival's Red Cone, 52328.
Widdringtonia whytei. See *Callitris whytei*.
Wilga, *Geijera parviflora*, 52801.

Xanthosoma sp., 52532.

Yam, *Dioscorea alata*, 52507.
Yautia, *Xanthosoma* sp., 52532.

Zea mays, 52616, 52718, 52719.
Ziziphus mauritiana, 52417.

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U. S. DEPARTMENT OF AGRICULTURE.
BUREAU OF PLANT INDUSTRY.

INVENTORY

OF

SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM APRIL 1 TO JUNE 30, 1921.

(No. 67; Nos. 52855 to 53895.)

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CONTENTS.

	Page.
Introductory statement	1
Inventory	6
Index of common and scientific names	95

ILLUSTRATIONS.

		Page.
PLATE	I. A hard-shelled passion fruit from tropical America. (*Passiflora maliformis* L., S. P. I. No. 53180)	36
	II. The parent tree of the Carchi avocado. (*Persea americana* Mill., S. P. I. No. 53185)	36
	III. The Carchi avocado, a variety of the Mexican race. (*Persea americana* Mill., S. P. I. No. 53185)	36
	IV. The Yungara potato, one of the best varieties of the Ecuadorian highlands. (*Solanum tuberosum* L., S. P. I. No. 53195)	36
	V. The higacho, an Andean relative of the papaya. (*Carica chrysopetala* Heilborn, S. P. I. No. 53754)	86
	VI. Akala, a giant Hawaiian raspberry. (*Rubus macraei* A. Gray, S. P. I. No. 53847	86
FIGURE	1. Map of Burma, Assam, and Siam, showing the route followed by J. F. Rock in his successful hunt for the true chaulmoogra tree	IV

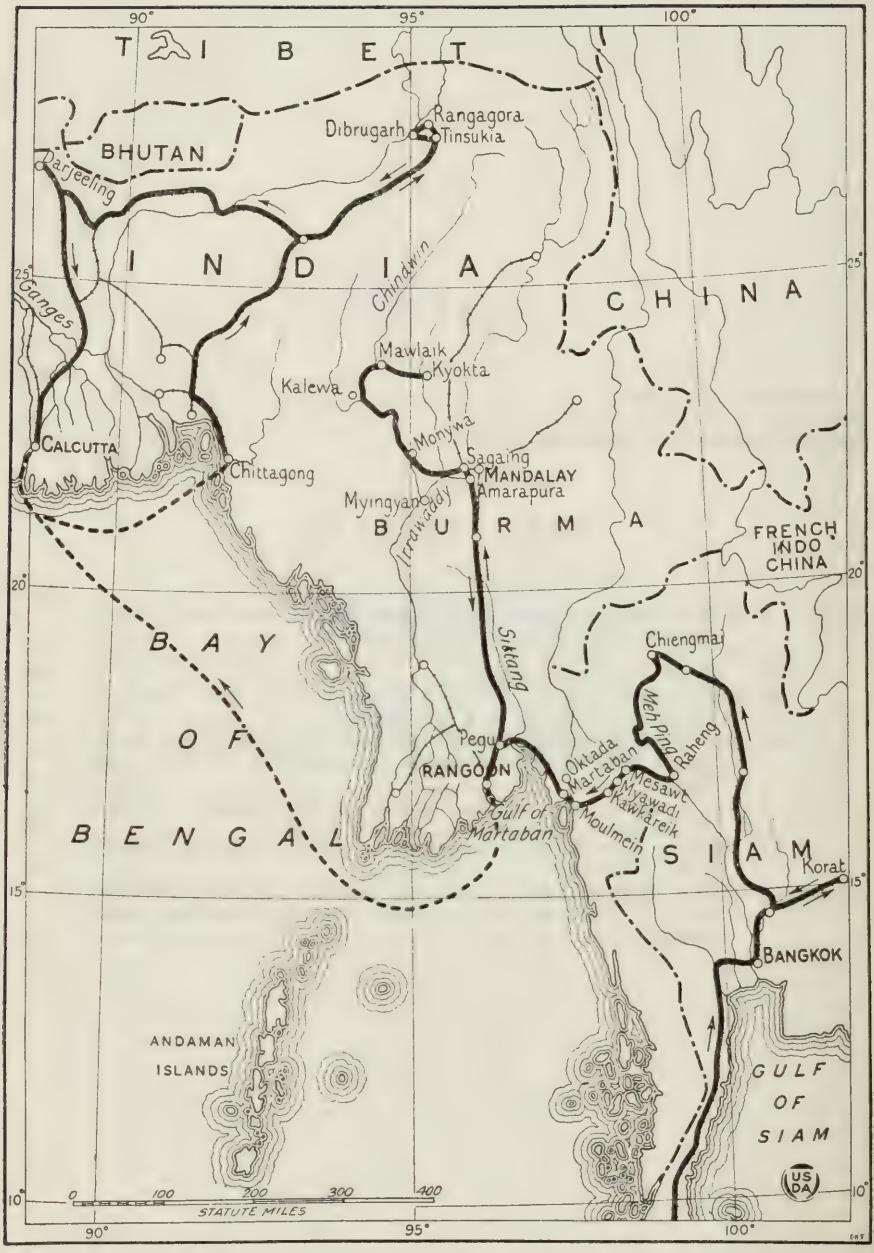


FIG. 1.—Map of Burma, Assam, and Siam, showing the route followed by J. F. Rock in his successful hunt for the true chaulmoogra tree, which yields the oil now considered a specific for leprosy. A large part of the country explored was practically unknown botanically. The first authentic photographs ever made of the true chaulmoogra tree and its relatives, which Mr. Rock succeeded in obtaining, have served to clear up the confusion existing as to the source of this exceedingly important product.

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INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM APRIL 1 TO JUNE 30, 1921 (NO. 67; NOS. 52855 TO 53895).

INTRODUCTORY STATEMENT.

This sixty-seventh inventory contains a part of the plant collections made by our Agricultural Explorer Wilson Popenoe in the highlands of Ecuador. These collections represent real exploration work of a strenuous and dangerous character in a country through which no one travels easily and in the remote regions of which most trying hardships—poor food, almost impassable roads, and malaria—are constant companions of the explorer. To penetrate into these regions, to bring out collections of living plants, and to land them successfully in the United States is a feat which deserves special mention, for it must not be forgotten that in some portions of this tropical country the hardships of travel have changed very little since the days when Robert Spruce visited them in search of the cinchona tree.

The collection consists of 47 species of plants carefully selected from the hundreds of curious and interesting species which compose the flora of Ecuador. Because of Mr. Popenoe's wide acquaintance with the horticultural plants in America, particularly those suited to the warmer parts of it, these should have a special interest to the experimenters who will read these descriptions. Owing to the difficulty of identifying Ecuadorian plants many of the species here described are not yet botanically classified further than as to their genera. The collections are numbered S. P. I. 53177 to 53217, 53485, and 53754 to 53758.

Among the more interesting plants from Ecuador are the Chota Valley avocados (Nos. 53182 to 53185 and 53895), which belong to the Mexican race but are unusually large and of excellent quality. These provide a strain of this hardy Mexican race which hitherto has not been tried in this country.

The discovery of the presence of the potato disease, *Phytophthora infestans*, in this the very home of the cultivated potato, which fact has been abundantly established by Professor Pachano, removes the mystery of the origin of this disease, which has puzzled pathologists for many years. Differences in the susceptibility of the different sorts were observed, but no resistant strains appear to be known there, although excellent varieties were secured and introduced (Nos. 53187 to 53197).

The Ecuadorian walnut, *Juglans* sp. (No. 53198), called there tocte, appears to be a valuable nut and forest tree.

A true sweet corn (No. 53217) from 7,000 feet altitude may indicate to the plant breeder the origin of the sweet corns of our gardens and may be useful in producing a variety for our own warmer regions.

Two promising new species of Rubus of good quality (*R. roseus*, No. 53218, and *R. adenotrichos*, No. 53219); a beautiful Andean barberry, *Berberis quinduensis* (No. 53177); the hard-shelled passion fruit, *Passiflora maliformis* (No. 53180), of promise for California; the quiqui, *Osteomeles obtusifolia* (No. 53485), a new tropical hawthornlike shrub which has been used as a stock for the apple in Ecuador; and the higacho, *Carica chrysopetala* (No. 53754), which resembles the mountain papaya, *Carica candamarcensis*, but is specifically distinct and may contribute material for the breeding problem of producing a small sweet-fruited papaya which can be shipped like a tomato or an avocado; are some of the plants which Mr. Popenoe found and introduced.

While Mr. Popenoe was carrying out a difficult piece of exploration work in Ecuador, Joseph F. Rock, our newly appointed agricultural explorer, was searching for the source of chaulmoogra oil in Siam and Burma. This oil, or rather the ethyl esters of its constituent chaulmoogric acid, which were originally discovered and described by Dr. Frederick B. Power, has come into great prominence as a cure for leprosy through the researches of Doctor Dean and his collaborators in Honolulu. The source of the oil, which comes into commerce through Burma, was quite obscure when Mr. Rock first took up the study of these trees and was commissioned as an agricultural explorer to investigate the whole subject; no photographs had ever been made of them. He spent several months in the jungles of Siam and Burma and went through experiences quite as thrilling and dangerous as any to which explorers in tropical countries are liable, including a unique one with a man-eating tiger. In the course of his explorations (fig. 1) he traversed the northern mountainous part of Siam, bordering on Burma, which had not previously been visited by botanists. Not only has he in large measure solved the problem of the source of chaulmoogra oil, but he obtained seeds of the true chaulmoogra tree (*Taraktogenos kurzii*, No. 53844) and of the more important allied trees, including *Hydnocarpus wightiana* (No. 52859) and also *H. castanea* and *H. anthelminthica* (recorded in Inventory No. 66 under Nos. 52514 and 52465), as well as the false chaulmoogra tree, *Gynocardia odorata* (No. 53121), which for years was erroneously supposed to be the source of chaulmoogra oil. Though Mr. Rock's main quest was the chaulmoogra trees—which quest he has described in Department Bulletin No. 1057, entitled "The Chaulmoogra Tree and Some Related Species," and in the National Geographic Magazine for March, 1922—he nevertheless obtained seeds of other trees and plants of great interest to those whose climatic surroundings will permit their cultivation.

The success of the bor (*Ziziphus mauritiana*) on the calcareous soils of southern Florida makes those who are already interested in this new fruit anxious to compare with the plants sent in from Mauritius Rock's variety (No. 52858) from the upper Chindwin River of Burma.

Plant breeders who are trying to produce larger and finer fruited varieties of blackberries and raspberries can not fail to be interested in the strains of the Hawaiian species of Rubus (*R. macraei*, Nos. 53480 to 53482, 53625, 53759, 53760, and 53847). The problem will be to find a suitable moist, cool, but not too cold, climate in which to grow both these Hawaiian and Mr. Popenoe's Ecuadorian species of Rubus.

The brilliant-berried *Vaccinium meyenianum* (No. 53488), from the volcano of Kilauea, and the showy white-flowered *Fagraea auriculata* (No. 53483), as well as the forest tree *Sterculia macrophylla* (No. 53484), which Mr. Rock introduced, will, it is hoped, find places in this country.

An unusual number of valuable species has been presented to the department by foreign institutions and by interested foreign amateurs, to whose generosity we have always been indebted in the past.

The Hon. Vicary Gibbs, of Herts, England, has sent us 21 varieties of the beautiful aster (*Aster novi-belgii*, Nos. 53009 to 53029), some of which are sure to beautify the dooryards of this country.

Victor O. Fletcher, of Hobart, Tasmania, has sent four new grasses (Nos. 53115 to 53118) that are proving valuable for forage on the dry hills of Tasmania, where the rainfall totals only 14 inches annually.

Sir David Prain, director of the Royal Botanic Gardens at Kew, has favored us with 19 new or rare species of Rubus (Nos. 52939 to 52951 and Nos. 53535 to 53540) and a very unusual collection of Berberis, Lonicera, Clematis, Rosa, Viburnum, and Cotoneaster (Nos. 53627 to 53752).

Consul Cavin, of Tananarive, Madagascar, presents a remarkable collection of the coffee species now recognized by botanists as distinct (Nos. 53454 to 53462).

Consul Goding, of Guayaquil, sends in a salmon-pink shaddock, or grapefruit (No. 53611).

Through the kindness of Messrs. Kenoyer and Dudgeon, of Ewing Christian College at Allahabad, India, we have come into possession of a remarkable collection of Indian tree and shrub seeds (Nos. 53563 to 53590). This includes *Bauhinia vahlii* (No. 53567), which they say is put to more uses than almost any other forest plant except the bamboo. It is a gigantic climber with white flowers turning to cream color and large flat leaves which are sewed together to make plates, cups, and even rough tablecloths, umbrellas, cloaks, and rain capes. It has grown well in southern Florida in Charles T. Simpson's hammock. The collection also contains *Boswellia serrata* (No. 53569), the source of Indian olibanum, used as an ingredient in incense; *Diospyros tupru* (Nos. 53572 and 53573), a tropical persimmon tree as yet not cultivated in India; nine flowering trees of promise for Florida (Nos. 53574 to 53582); two stately trees (*Sterculia urens*, No. 53588, and *Terminalia tomentosa*, No. 53589) suitable for street use; a variety of purple-stemmed wheat from the Ganges Valley (No. 53590); and a species of jujube (*Ziziphus xylopyrus*, No. 53593), the charred fruits of which make a black dye for leather.

John McLaren, superintendent of Golden Gate Park, San Francisco, has contributed a new ornamental Chilean shrub with small edible fruits possessing a raspberry flavor, *Eugenia luma* (No. 53591).

Benito Carrasco has sent in a plant for covering bare arid soils, which produces ivory-white berries with a pineapple flavor, *Salpichroa rhomboidea* (No. 53608).

Friends of P. H. Rolfs will watch with interest the growth of two new grasses from Minas Geraes, Brazil (*Axonopus* sp., No. 52917, and *Brachiaria plantaginea*, No. 52918); the former, he finds, covers the ground there more densely than does the best St. Augustine grass, being very persistent and crowding out everything else.

Before he was wounded and obliged to return to America, the noted naturalist, George K. Cherrie, of the American Museum of Natural History in New York, sent in some seeds of a remarkable blackberry (*Rubus* sp., No. 53545) which he discovered on the Zamora River in Ecuador at an altitude of 5,500 feet. Of it he remarks, "I do not believe I have ever seen such tremendous clusters of berries. The latter are large and to me very fine flavored."

P. J. Wester, to whom we are indebted for many Philippine plants, presents in this inventory a new and practically seedless variety of the mabolo, a tropical persimmon (*Diospyros discolor*, No. 53555), which is sweeter, more juicy, and of better flavor than the ordinary sort and ought to be distributed throughout the Tropics.

Doctor Proschowsky, of Nice, France, whom few correspondents have equaled in generosity, has added to his gifts the wild apple from the high plateau of Indo China (*Malus laosensis*, No. 52900). Since this grows into a large tree and produces fruit similar in shape, color, and flavor to certain cider pears of Normandy, but grows wild in the dense forests of Indo China, it may possibly prove valuable either as a stock or in the creation of an apple which can be grown in southern latitudes. The wild apple (*Malus doumeri*, No. 53008), which Mr. Miéville, of the Agricultural Station at Chieng Khuang, sent in from Laos, Indo China, may prove similarly useful.

P. C. Standley, of the National Museum, has recently described a tropical persimmon (*Diospyros conzattii*, No. 53176), which produces fruit superior, in his opinion, to that of *D. ebenaster*, and resembles somewhat the delicious sapodilla. It may prove suitable for cultivation in parts of Florida, Hawaii, and Porto Rico.

The spiny palms of the genus Acrocomia have proved to be very rapid growers in southern Florida, some of them equaling the coconut in this respect when planted on pinelands. In view of its ability to withstand severe drought, its hardiness, and the value of its kernels, the macauba palm (*Acrocomia sclerocarpa*, No. 53487), which Thomas R. Gwynn has sent in from Paraguay, would appear to be a most desirable introduction.

The fundi grass of Nigeria (*Digitaria exilis*, No. 53486) Professor Piper reports has proved remarkably promising for forage in the Southern States.

The apricot of Harput, Syria (No. 52914), which grows to be as large as a peach and possesses a remarkable flavor, deserves to be tried in California.

The rapid-growing timber tree of China (*Catalpa bungei*, No. 52909), which Frank N. Meyer reported as growing to 100 feet in height and 15 feet in diameter and furnishing a light, strong, durable, and nonwarping timber resembling walnut, has shown itself at home in Maryland and deserves to be widely tried in those regions where the chestnut blight has destroyed the American chestnut trees.

Dendrocalamus strictus (No. 53610), the forest bamboo of India, which grows to a height of 100 feet and, unlike most other species, produces seeds in abundance, deserves to be widely grown throughout the regions warm enough for its culture.

Hydrangea petiolaris (No. 52937) is a remarkable deciduous climber which is ideal for covering the trunks of old dead trees and is serviceable—like the Japanese ivy—for screening rock and brick walls.

The palangi (*Brassica rugosa*, No. 53542), an early cold-weather crop growing in the hills of the central, eastern, and western Himalayas and cultivated in Nepal, may be worthy of special study. The leaves of its loose head are plucked and eaten as fast as they develop, and an oil is extracted from its seeds. Has any plant breeder worked with this species?

As illustrating a new reason for introducing foreign plants, special attention might be called to the collections of grasses, barberries, legumes, borages, etc., which have been received from Sweden, Denmark, and Holland for the use of the pathologists of the department who are engaged in studying the great problem of controlling the rusts of cereals. These rusts have stages in which they inhabit as secondary hosts a variety of plants, notably the barberries.

The botanical determinations of seeds introduced have been made and the nomenclature determined by H. C. Skeels, and the descriptive and botanical notes have been arranged by G. P. Van Eseltine, who has had general supervision of this inventory. Miss Patty Newbold has assisted in the compilation of descriptive notes.

DAVID FAIRCHILD,
Agricultural Explorer in Charge.

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION,
Washington, D. C., November 29, 1922.

INVENTORY.[1]

52855 to 52858.

From Burma, India. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received April 4, 1921. Quoted notes by Mr. Rock.

52855. CANAVALI sp. Fabaceæ.

"*Tayok Pedalet.* Native to Upper Burma. This bean is extensively cultivated in Mandalay and is considered to contain a higher percentage of nitrogen than any other bean found in India or Burma."

52856. HIBISCUS sp. Malvaceæ.

"*Ma ha ka.* A Siamese plant from the forests near Lampang, northern Siam. A beautiful large-flowered scandent bush. Tubers of this plant were sent from Chiengmai."

52857. PHASEOLUS CALCARATUS Roxb. Fabaceæ. **Rice bean.**

"*San to hai.* A bean indigenous to Upper Burma and cultivated in Mandalay. The beans are eaten with rice when mature. Collected February 3, 1921."

52858. ZIZIPHUS MAURITIANA Lam. Rhamnaceæ. **Bor.**
(*Z. jujuba* Lam., not Mill.)

"A shrub with small, red, sweet-acid fruits the size of a large cherry, from a wild plant found near Okma on the upper Chindwin River. Specimen No. 843. Collected February 1, 1921."

For previous introduction, see S. P. I. No. 46720.

52859. HYDNOCARPUS WIGHTIANA Blume. Flacourtiaceæ.

From Calcutta, India. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received April 15, 1921.

"(Calcutta, India. March 8, 1921.) These seeds were found in old fruits under two trees about 30 feet high which were loaded with immature fruits. I examined a number of these seeds and found that they were still in good condition. They will require sandy soil. At present the oil from the seeds is used in Calcutta (School of Tropical Medicine) in the treatment of leprosy." (*Rock.*)

For previous introduction, see S. P. I. No. 51362.

52860. PEUCEDANUM OSTRUTHIUM (L.) Koch. Apiaceæ.

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received April 5, 1921.

A perennial herb native to the French Alps. The acid aromatic root is used in medicine, particularly in veterinary practice. It is utilized also for the preparation of some kinds of Swiss cheese. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 366.*)

[1] All introductions consist of seeds unless otherwise noted.
It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in this inventory are those under which the material was received when introduced by the Office of Foreign Seed and Plant Introduction; and, further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in this inventory will be subject to change with a view to bringing the forms of the names into harmony with recognized American codes of nomenclature.

52861 and 52862.

From San Jose, Costa Rica. Seeds presented by Sr. A. Tonduz. Received April 11, 1921.

52861. CANAVALI PLAGIOSPERMA Piper. Fabaceæ.

"From the gardens of Sra. Amparo de Zeledon, Puntarenas." (*Tonduz.*)

A species based on specimens grown from seeds received from Mauritius in 1913; also received from Nicaragua in 1917. The seed resembles the sword bean in appearance, but it has the short hilum of the jack bean.

52862. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

"From the gardens of Sra. Amparo de Zeledon, Puntarenas." (*Tonduz.*)

52863. DIOSCOREA TRANSVERSA R. Br. Dioscoreaceæ. Queensland yam.

From Brisbane, Queensland. Seeds presented by C. T. White, Government botanist. Received April 12, 1921.

"A species common in coastal Queensland, where it produces small tubers of excellent quality." (*White.*)

For previous introduction, see S. P. I. No. 1331.

52864. LEYCESTERIA FORMOSA Wall. Caprifoliaceæ.

From Beaverton, Oreg. Plants presented by Benjamin W. Gothard. Received April 15, 1921,

"One of the handsomest and most useful of ornamental shrubs for all sections where the temperature does not fall much below zero. It is not subject to pests, is in bloom for months, and if cut down by severe frost it renews itself within a short time. Last winter, in sheltered situations, it endured zero temperature without injury. Here in Oregon it roots freely from hardwood cuttings in open ground when put in during November or December." (*Gothard.*)

A Himalayan bush, 6 feet high, allied to our Viburnums. The pink flowers backed by red bracts are borne in dense sprays at the end of fresh wood shoots

For previous introduction, see S. P. I. No. 41558.

52865. FICUS MACROPHYLLA Desf. Moraceæ.

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, in charge, Department of Botany and Forestry. Received April 16, 1921.

One of the best Australian avenue trees; it has proved of value in southern California.

"The milky sap of this tree yields a very fair caoutchouc. The fiber of the root is of great durability." (*Maiden, Useful Native Plants of Australia, pp. 225 and 623.*)

For previous introductions, see S. P. I. Nos. 3494 and 37140.

52866. SOLANUM QUITOENSE Lam. Solanaceæ. Naranjilla.

From Guayaquil, Ecuador. Seeds presented by Dr. Frederic W. Goding, American consul general. Received April 19, 1921.

For use in hybridizing experiments to secure disease resistance.

For previous introduction, see S. P. I. No. 50607.

52867. DIOSCOREA PENTAPHYLLA L. Dioscoreaceæ. Round yam.

From Aulnay sous Bois, France. Tubers presented by Prof. R. de Noter, director, École d'Acclimatation et de Recherches Agricoles. Received April 7, 1921.

Variety *hortorum*.

"*Igname ronde de Chine* (round yam of China). The tubers made the first season, from plants grown from 'eyes' dug and replanted, weigh 1½ kilograms each; the second year the tuber may weigh 4 to 5 kilograms. The plant requires light sandy clay or, better, calcareous, richly fertilized soil. The tubers are gathered at the first frost and stored in the cellar. Storage for two years does not injure but improves the tubers. This yam is an excellent vegetable of delicate flavor and makes delicious fritters, cakes, and soufflés. The leaves, after the harvest, are used as cattle feed." (*De Noter.*)

52868 and 52869. CUCUMIS SATIVUS L. Cucurbitaceæ.

Cucumber.

From Erfurt, Germany. Purchased from Ernst Benary. Received April 21, 1921. Quoted notes by Mr. Benary.

Introduced for specialists of the department.

52868. "Short green early." 52869. "Short green Parisian."

52870 to 52889.

From Christiania, Norway. Seeds presented by Dr. N. Wille, director, Botanic Garden. Received April 1, 1921.

Introduced for experimental work in cereal-rust control.

52870. ACONITUM LYCOCTONUM L. Ranunculaceæ. **Monkshood.**

A yellow-flowered ornamental yielding an alkaloid similar to aconitin.

52871. AGROPYRON sp. Poaceæ. **Wheat-grass.**

Received as *Triticum sibiricum* (=*Agropyron sibiricum*), but the seeds are unlike those of that species that have been received heretofore.

52872. AIRA CAESPITOSA L. Poaceæ. **Hair-grass.**

This tufted perennial grass often forms excellent forage in mountain meadows.

52873. AIRA FLEXUOSA L. Poaceæ. **Hair-grass.**

A very slender grass with delicate purplish inflorescences.

52874. BERBERIS CHINENSIS Poir. Berberidaceæ. **Barberry.**

For previous introduction, see S. P. I. No. 36737.

52875. BERBERIS CHINENSIS Poir. Berberidaceæ. **Barberry.**

Received as *Berberis spathulata*, which is now considered to be the same as *B. chinensis*.

52876. BERBERIS GUIMPELI Koch and Bouche. Berberidaceæ. **Barberry.**

A hardy barberry, 4 to 6 feet tall, with handsome purplish fruits.

For previous introduction, see S. P. I. 44525.

52877. BERBERIS INTEGERRIMA Bunge. Berberidaceæ. **Barberry.**

A rather variable but attractive black-fruited species up to 6 feet tall.

For previous introduction, see S. P. I. No. 49060.

52878. × COLUTEA MEDIA Willd. Fabaceæ. **Bladder senna.**

Ornamental shrub, 10 feet tall, with orange and reddish yellow flowers and grayish green foliage.

52879. COLUTEA ORIENTALIS Mill. Fabaceæ. **Bladder senna.**

Flowering shrub similar to the preceding but of lower growth. Flowers during the summer.

For previous introduction, see S. P. I. No. 33314.

52880. ELYMUS ARENARIUS L. Poaceæ. **Lyme-grass.**

A coarse perennial grass used for sand binding on the seacoast.

For previous introduction, see S. P. I. No. 52795.

52870 to 52889—Continued.

52881. KOELERIA ALPICOLA Gren. and Godr. Poaceæ. **Grass.**

A tufted low perennial grass from the high mountain slopes.

Received as *Koeleria australis*, but the sample does not agree with that species.

52882. MELICA NUTANS L. Poaceæ. **Melic grass.**

A loosely tufted European grass useful for grazing.

52883. NONNEA ROSEA (Bieb.) Link. Boraginaceæ. **Rose alkanet.**

An attractive hardy annual with rose-colored, funnel-shaped flowers, closely allied to Anchusa.

For previous introduction, see S. P. I. No. 51041.

52884. SECALE sp. Poaceæ. **Rye.**

Received as *Secale montana*, but the sample does not agree with that species.

52885. SYMPHYTUM OFFICINALE L. Boraginaceæ. **Comfrey.**

Hardy perennial sometimes grown as a border plant for its foliage.

52886. THALICTRUM GLAUCUM Desf. Ranunculaceæ. **Meadow rue.**

An attractive hardy perennial 2 to 5 feet tall, with handsome gray-green, much-divided foliage and dainty yellow flowers.

52887. THALICTRUM MINUS NUTANS Regel. Ranunculaceæ. **Meadow rue.**

A form of this dainty border plant, a foot or more in height.

52888. TORRESIA ODORATA (L.) Hitchc. Poaceæ. **Holy grass.**

A low sweet-scented perennial grass used for basket making.

52889. TRISETUM SPICATUM (L.) Richter. Poaceæ. **Downy oat-grass.**

An erect tufted grass of value for grazing on high mountain slopes.

For previous introduction, see S. P. I. No. 28543.

52890 to 52892. CORCHORUS OLITORIUS L. Tiliaceæ. **Jute.**

From Dacca, Bengal, India. Seeds presented by Robert S. Finlow, fiber expert to the Government of Bengal, through Lieut. Col. A. T. Gage, director, Botanical Survey of India, Calcutta. Received April 8, 1921.

Nalta jute. A tall, herbaceous, sometimes woody annual, 1 to 5 meters high, sparingly branched, and bearing smooth, ovate-lanceolate leaves and small yellow flowers. The many-seeded beaked capsule is perfectly cylindrical. (Adapted from *Bureau of Agriculture, Philippine Islands, Farmers' Bulletin No. 11, p. 8.*)

The following varieties are named selections which are introduced for testing by the Office of Fiber Investigations:

52890. Green.

52891. R26.

52892. R30.

For previous introduction, see S. P. I. No. 25052.

52893 and 52894.

From Aulnay sous Bois, France. Presented by Prof. R. de Noter, École d'Acclimatation et de Recherches Agricoles. Received April 4, 1921. Quoted notes by Professor de Noter.

52893. ATRIPLEX HORTENSIS L. Chenopodiaceæ. **Orache.**

"Seeds of a variety with an exceedingly delicate flavor; it is easy to clean with very little waste. It brings three times the price of ordinary spinach [in France]; the plant is 2¼ meters (6½ feet) high and

52893 and 52894—Continued.

furnishes 1 kilogram (2⅓ pounds) at a single picking, 44 large succulent leaves, 20 to 30 centimeters long. It loses only one-fourth of its weight in cooking, while common spinach loses three-fourths of its weight and requires 300 leaves to make a kilogram. It makes a delicious salad. The plant is very hardy and easy to cultivate in any climate. The seeds can be sown at the end of February in northern Europe, and the plant thrives as well as it does in warm countries. The leaves are ready for picking two months after sowing, and on fertile soil the plant will yield all summer; any surplus can be fed to animals.

"The seeds, milled and bolted into flour, make an excellent feed. The analysis of the seeds shows the following percentages: Protein, 24.62; fat, 6; sugar and starch, 53.70; cellulose, 1.92; mineral matter, 3.46; water, 10.30. In Mexico this brown flour is used to make cakes.

"The stalks can be used for the extraction of cellulose and the manufacture of paper. An analysis of the dried stalks shows percentages as follows: Protein, 3; fat, 1.20; sugar and starch, 35.50; cellulose, 46.04; mineral matter, 5.16; water, 9.10."

For previous introduction, see S. P. I. No. 2003.

52894. POLYMNIA EDULIS Wedd. Asteraceæ.

"Tubers of a strong herbaceous plant, very decorative with its tall stalks 1 5 meters high, beautiful foliage, and yellow, autumnal flowers. The numerous, clustered, clean tubers are white, almost transparent, excessively sweet, and have a slight pear flavor. They are eaten raw in their native country, where they are keenly relished. The leaves, stalks, and tubers are greedily eaten by animals. The enormous quantity of sugar in the tubers yields three times as much alcohol as can be distilled from the Irish potato. Molasses can also be made from the tubers. A half-decayed tuber grew a plant which bore 32 tubers 15 to 20 centimeters long, weighing 3 kilograms.

"This hardy plant occurs wild and is also cultivated in the Andes Mountains. In Algeria irrigation is necessary. In any case, half of the foliage can be used during the summer for feed. At harvest the tubers are stored in a cellar. The plant is easily lifted from the soil and is superior to the Jerusalem artichoke and the sunflower in that it leaves nothing behind."

52895 to 52897.

From Kulara, Queensland, Australia. Seeds presented by J. A. Hamilton. Received April 14, 1921.

52895. ALBIZZIA LOPHANTHA (Willd.) Benth. Mimosaceæ.

A rapid-growing tree from Western Australia. The bark contains 8 per cent of tannin and the dry root 10 per cent of saponin. Cattle browse on the leaves. (Adapted from *Maiden, Useful Native Plants of Australia, pp. 117, 315, and 537.*)

For previous introduction, see S. P. I. No. 8243.

52896. ALPHITONIA EXCELSA (Fenzl) Reissek. Rhamnaceæ.

A tree 50 feet high, one of the characteristic trees of the Brigalow scrubs of New South Wales, Queensland, and northern Australia, with hard close-grained durable wood which takes a high polish; it is suitable for gunstocks, coopers' staves, and for indoor purposes. The wood is tough and warps in drying; near the outside it is pinkish and the inner wood is dark brown. The bark is occasionally used for tanning. (Adapted from *Maiden, Useful Native Plants of Australia, p. 373.*)

52897. PLEIOGYNIUM SOLANDRI (Benth.) Engl. Anacardiaceæ.
(*Spondias pleiogyna* F. Muell.)

A tree native to Queensland; the hard dark-brown wood with red markings resembles that of the American walnut. The grain is fairly close and splits quite straight. It is an excellent wood for the joiner or cabinetmaker and is also suitable for turnery. (Adapted from *Maiden, Useful Native Plants of Australia, p. 599.*)

52898 to 52900.

From Nice, France. Presented by Dr. A. Robertson Proschowsky, Jardin d'Acclimatation. Received April 18, 1921. Quoted notes by Doctor Proschowsky.

52898. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

"Seeds of varieties of peaches from Laos, French Indo China."

52899. CYPERUS ESCULENTUS L. Cyperaceæ. **Chufa.**

"Tubers which can be kept in sand in perfect state for months and which have a very good taste like very sweet almonds. The plant grows with the greatest facility, does not require much moisture, and yields an abundant crop. When the tubers are planted in March the crop is ripe in October and November."

For previous introduction, see S. P. I. No. 43578.

52900. MALUS LAOSENSIS (Cardot) Cheval. Malaceæ. **Laos apple.**
(*Pyrus laosensis* Cardot.)

Seeds of an interesting species of apple growing wild on the high plateaus of Indo China at Tranninh at an altitude of 1,500 meters and also on certain mountains of the Tonking. It is a large tree which produces fruit similar in shape, color, and flavor to certain cider pears of Normandy. A drink has been made of it the color of which recalls the Normandy pear cider. Although this species grows in the dense forest and is uncared for by the mountain people, it may have been cultivated and improved in the past. The trees from which this seed was obtained may be remnants of specimens cultivated as sacred trees around certain Laos pagodas where the priests cared for them. (Adapted from *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences, Paris, vol. 170, p. 1129.*)

52901. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From Reading, England. Tubers presented by Sutton & Sons. Received April 20, 1921.

"*Dunnotar Castle.* The crop yielded over 13 tons per acre." (*Sutton.*)

For use in breeding work.

52902. CALAMUS sp. Phœnicaceæ. **Rattan palm.**

From Lamao, Bataan, Philippine Islands. Seeds presented by Adn. Hernandez, Director of Agriculture. Received April 26, 1921.

"*Bejuco* seed." (*Hernandez.*)

For a discussion of rattan palms in the Philippines, see Brown and Merrill, Philippine Palms and Palm Products, pages 34 to 54.

52903 and 52904.

From Nairobi, Kenia, Africa. Seeds presented by Alexander Holm, Director of Agriculture. Received April 8, 1921.

52903. CAPRIOLA sp. Poaceæ. **Grass.**

"Probably an undescribed species of Capriola." (*C. V. Piper.*)

52904. CAPRIOLA sp. Poaceæ. **Grass.**

"Apparently a mixture of two species of Capriola." (*C. V. Piper.*)

52905. DIOSCOREA ESCULENTA (Lour.) Burkill. Dioscoreaceæ. **Lesser yam.**

From Dominica, British West Indies. Tubers presented by A. Keys, acting curator, Botanic Gardens. Received April 11, 1921.

"*Silver.* This yam is better known locally as the 'Silk yam.'" (*Keys.*)

"A small-tubered, smooth, tough-skinned yam having white flesh of good quality." (*R. A. Young.*)

52906 to 52908. Dioscorea alata L. Dioscoreaceæ.
Greater yam.

From Antigua, British West Indies. Tubers presented by F. G. Harcourt, agricultural superintendent. Received April 11, 1921.

52906. "*Bottle-Neck Lisbon.* This variety is economically preferred to the ordinary Lisbon yam, the tubers being of better shape and less forked; also generally considered to be of slightly better quality." (*Harcourt.*)

"A light-brown, rather thin-skinned, white-fleshed yam. The tubers reach a weight of several pounds each. The quality is excellent, the flesh being mealy, fine grained, and of rich but delicate flavor when cooked." (*R. A. Young.*)

52907. "*Lisbon.* A yam of very good quality. The tubers are irregular in shape, showing a tendency to forking." (*Harcourt.*)

"A white-fleshed yam of excellent quality, fine grained and of delicate, rich flavor when cooked. The skin is light brown and rather thin. The tubers usually attain a weight of several pounds each." (*R. A. Young.*)

52908. "*Horn.* The tubers of the *Horn* yam usually curve upward, i. e., toward the surface of the soil, and are rather brittle." (*Harcourt.*)

"A white-fleshed yam having dark-brown, rather thick skin. The flesh remains white when cooked and is of good quality, though the texture is not quite so fine as that of the Lisbon varieties. The tubers are long and generally curved. They commonly attain a weight of several pounds each." (*R. A. Young.*)

52909. Catalpa bungei Meyer. Bignoniaceæ.

From Nanking, Kiangsu, China. Seeds presented by J. L. Buck, College of Agriculture and Forestry, University of Nanking. Received May 3, 1921.

"A rapid-growing Chinese tree, up to 100 feet in height, with a trunk 10 to 15 feet in circumference a few feet above the ground. The wood, which is strong, light, durable, and nonwarping, resembles walnut to a large extent and is in much demand for fine furniture. The tree might be cultivated in the semiarid sections of the United States where the winters are not too severe. It prefers a porous soil and is easily propagated from suckers which spring up from the roots that are near the surface of the ground." (*F. N. Meyer.*)

For previous introduction, see S. P. I. No. 44664.

52910. Brassica pekinensis (Lour.) Gagn. Brassicaceæ.
Pai ts'ai.

From China. Seeds collected by Frank N. Meyer, Agricultural Explorer of the United States Department of Agriculture. Numbered April, 1921.

These seeds were found in Mr. Meyer's baggage with no descriptive notes.

52911. Zea mays L. Poaceæ. **Corn.**

From Bogota, Colombia. Seeds collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received November 19, 1920. Numbered April, 1921.

"(No. 493a. Collected at Bogota market. October 14, 1920.) Flint corn of the variety commonly seen in this region. Of interest to those engaged in corn breeding."

52912. Pterocarpus erinaceus Lam. Fabaceæ.

From Ibadan, Southern Provinces, Nigeria. Seeds presented by John G. Davis, acting Director of Agriculture. Received April 6, 1921.

A more or less deciduous tree 15 to 20 meters high, with a straight trunk, spreading crown, and pubescent branchlets. The glabrous leaves are unequally

pinnate. The flowers are in terminal panicles with racemose branches. The tree extends into Natal, Swaziland, the Transvaal, to the West Coast, and from the coast to the Matapos. A valuable and durable timber found in great abundance and the most valuable asset Mozambique Province has in its tropical forests. It produces also the African gum *kino*. (Adapted from *Sims, Forest Flora of Portuguese East Africa, p. 44.*)

52913. ALLIUM CEPA L. Liliaceæ. **Onion.**

From Valencia, Spain. Seeds presented by John R. Putnam, American consul. Received April 1, 1921.

Seeds of the onion which is grown on an extensive scale in Denia, Spain. These onions come upon the American market in a peculiar type of package and are the large yellow or straw-colored onions sold as Spanish onions.

52914. PRUNUS ARMENIACA L. Amygdalaceæ. **Apricot.**

From Aleppo, Syria. Seeds presented by Digby A. Willson, vice consul in charge. Received April 6, 1921.

"The apricot grown in the Harput (Kharpoot) district is recognized to be the most luscious and most sought for noncitrus fruit in the Near East. In order that our Department of Commerce and our Department of Agriculture may understand the climate under which the Harput apricot is cultivated, the following information is given:

"The city of Harput is situated in about the same altitude as Denver, Colo., being slightly more than 5,000 feet above sea level. During the summer, which is very hot, little water is found in the district, owing to the entire lack of rain in the summer months, but the winter is extremely cold and snowstorms are not infrequent. The apricot trees usually grow throughout the city in the various gardens, which are irrigated from small streams supplying sufficient water for the cultivation of the trees after the spring rains. Great care is exercised in the cultivation of the Harput apricot, resulting in a delicious fruit about the size of an ordinary peach; the apricots are ripe and ready for picking about the last of May or the first days in June. I am informed by many naturalized Americans from the Harput district that these apricot trees will grow in southern California." (*Willson.*)

52915. SCLEROCARYA BIRREA (A. Rich.) Hochst. Anacardiaceæ.

From Matarieh el Saff, Egypt. Seeds presented by A. Bircher, director, Middle Egypt Botanic Station. Received April 7, 1921.

A tree with narrow, glabrous, 9 to 23 foliolate leaves tufted at the ends of the branches. The elliptic, entire, leathery pinnæ are 2 inches in length. The globose, glabrous, whitish yellow drupes, 1 inch long, are borne singly on stout peduncles. A fermented liquid is prepared from the sweetish acid flesh. The stony nut contains two or four seeds of a walnutlike flavor. Native to Upper Guinea and the Nile land. (Adapted from *Tancredi, Colonia Eritrea, p. 112*).

52916. MELILOTUS ALBA Desr. Fabaceæ. **White sweet clover.**

From Madrid, Spain. Seeds presented by A. Frederico Gredills, curator, Botanic Garden. Received April 5, 1921.

For experimentation by the Office of Forage-Crop Investigations.

52917 to 52922.

From Bello Horizonte, Minas Geraes, Brazil. Seeds presented by Prof. P. H. Rolfs, through Prof. C. V. Piper, United States Department of Agriculture. Received April 1, 1921. Quoted notes by Professor Rolfs.

52917. AXONOPUS sp. Poaceæ. **Grass.**

"Collected at Vicosa. A grass that has some very good points, for grazing purposes, very leafy, covering the ground more densely than *St. Augustine* at its best. Where the leaves are not cropped off by grazing it stands about 8 inches tall. Zebu have grazed it considerably.

52917 to 52922—Continued.

It is very persistent in its own patches and crowds out practically everything else. The patches that I saw produced very little seed; possibly more will be produced when we get into the beginning of the dry season."

52918. BRACHIARIA PLANTAGINEA (Link) Hitchc. Poaceæ. **Grass.**

"Collected at Ponto Novo; where it occurred it crowded out practically everything else. It made a dense covering, the leafy part of it standing about 2½ feet tall. I saw it growing at all the points visited and find it also present here at Bello Horizonte. It looks as though it may be perennial here. The seed habits seem to be good, as it appears to ripen about all at the same time."

For previous introduction, see S. P. I. No. 21961.

52919. HOLCUS HALEPENSIS L. Poaceæ. **Johnson grass.**
(*Sorghum halepense* Pers.)

"Collected at Ligacao. Appears to be a sorghum that grows natively as a weed."

52920. PASPALUM sp. Poaceæ. **Grass.**

"Collected at Furtados de Campos."

52921. PASPALUM sp. Poaceæ. **Grass.**

"Collected at Ligacao."

52922. VALOTA INSULARIS (L.) Chase. Poaceæ. **Grass.**

"Collected at Ponto Novo. Occurs rather abundantly along the roadside."

52923. LAUROCERASUS ILICIFOLIA (Nutt.) Roemer. Amygdalaceæ.
(*Prunus ilicifolia* Walp.)

From Los Angeles, Calif. Seeds presented by P. D. Barnhart. Received April 5, 1921.

"Wild cherry, for trial as stock and as an ornamental evergreen tree." (*Barnhart.*)

For previous introduction, see S. P. I. No. 39584.

52924 to 52926. LILIUM spp. Liliaceæ. **Lily.**

From Ootacamund, Bombay Presidency, India. Presented by F. H. Butcher, curator, Government Botanic Gardens and Parks. Received April 1, 1921.

52924. LILIUM NEILGHERRENSE Wight.

Bulbs of an Indian lily with a globose bulb 5 to 7.5 cubic millimeters in diameter, with a stiff stem 3 to 6 decimeters high, creeping at the base, and with 30 to 40 crowded leaves. The one to three white ascending fragrant flowers are 15 to 18 cubic millimeters long and trumpet shaped. The perianth segments are oblanceolate, reflexed only at the tips. (Adapted from *Botanical Gazette, vol. 27, p. 242.*)

52925. LILIUM NEPALENSE D. Don.

Bulbs of a magnificent species, of striking beauty, generally considered too tender for open-air culture except in the more favored parts of England, introduced from Nepal in 1824. The plant grows 1 to 3 feet high and bears nodding bell-shaped flowers of a beautiful soft yellow, the lower half of the gracefully recurved segments being blotched with bright purple-brown and shaded with maroon. (Adapted from *Journal of Horticulture and Home Farmer, 3d ser., vol. 54, p. 348.*)

52926. LILIUM NEILGHERRENSE Wight.

Seeds of S. P. I. No. 52924.

52927. DIOSCOREA ALATA L. Dioscoreaceæ. **Greater yam.**

From Arch Creek, Fla. Tubers presented by J. DeHoff. Received April 23, 1921.

"I procured one tuber in 1893, when I first came to Avon Park, Fla., from a neighbor, H. G. Burnett, who had in his garden a few which he procured from his father-in-law at Fort Myers where small quantities have been grown, I understand, for 50 years. I had kept seed from year to year since that time, no more though, than I wanted myself, until year before last when somehow they made several times more seed bulbs than I ever saw before. This last year they again made only very few seed tubers. I received them under the name of 'White Jamaica yam.' I grew them for five years near Palatka (at Florahome) and they did well on high hammock land. Down here in Dade County, on very light sandy and rocky land, they produce as much as sweet potatoes and, with me, take the place of Irish potatoes; the latter will not succeed on this dry soil at all. The yams keep for months." (*DeHoff.*)

"A white-fleshed yam, fairly dry when cooked, and of excellent quality. The vine produces aerial tubers, which are referred to in Mr. DeHoff's letter as 'seed tubers.'" (*R. A. Young.*)

For previous introduction, see S. P. I. No. 37943.

52928 to 52951.

From Kew, England. Seeds presented by Sir David Prain, director, Royal Botanic Gardens. Received April 4, 1921.

52928. ACANTHOPANAX SETUENENSIS Harms. Araliaceæ.

A bush 2 to 3 millimeters high, native to western Hupeh, where it is found in thickets at altitudes of 1,800 to 2,100 meters. The white flowers, in short-peduncled umbels, are followed by black fruits. This species is closely related to *Acanthopanax leucorrhizus*, but is easily distinguished from it by the leaves with almost invariably three leaflets, by their glaucous underside, their more coriaceous texture, and by their more remote and shallower serration. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 599.*)

52929. ARALIA CHINENSIS GLABRESCENS (Franch. and Sav.) C. Schneid. Araliaceæ.

A black-fruited bush 3 millimeters high, native to China in thickets at altitudes of 900 to 2,700 meters. This variety differs from the type in the glabrous or nearly glabrous glaucescent under side of the leaflets; and from the equally glabrous *Aralia chinensis* variety *mandshurica* it differs chiefly in the usually smaller, more papery leaflets with smaller appressed teeth. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 567.*)

52930. BERBERIS EDGEWORTHIANA C. Schneid. Berberidaceæ. **Barberry.**

A small shrub native to Simla, British India, with yellowish gray branches and one to two parted yellowish spines about 2 centimeters long. The elliptic-lanceolate membranaceous leaves are green above and paler below, 1 to 3 centimeters long. The small flowers, 4 millimeters in diameter, are in dense cymes up to 3 centimeters long. (Adapted from *Bulletin Herbier Boissier, 2d ser., vol. 8, p. 263.*)

52931. BERBERIS FRANCISCI-FERDINANDI C. Schneid. Berberidaceæ. **Barberry.**

A rather striking species apparently most nearly related to the Himalayan *Berberis chitria*, which is well distinguished, however, by its puberulent branchlets, the longer stalked and numerous ovules, and by the distinct styles. The handsome shrub is 2 to 3 meters high, with red young branches, thereafter purplish, glabrous, and shining.

The simple, yellowish red spines are up to 2.5 centimeters long. The papery deciduous leaves are ovate or ovate-lanceolate with marginal spines 1 to 1.5 millimeters long. The yellow flowers 7 to 9 millimeters in diameter are in dense panicles 5.5 to 12 centimeters long. The scarlet ovate fruits are 12 millimeters in diameter. Native to thickets in western China at altitudes of 1,300 to 4,000 meters. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 367.*)

52928 to 52951—Continued.

52932. BERBERIS sp. Berberidaceæ. **Barberry.**

Received as *B. leitchlinii*, for which a place of publication has not been found.

52933. BETULA MEDWEDIEWI Regel. Betulaceæ. **Birch.**

A lofty tree, with erect branches and twigs, found in forest borders at an altitude of 6,800 feet on Mount Somlia, Transcaucasia. The papery ovate leaves, glabrous and olive green above, are paler below and sometimes pilose on the veins. The staminate catkins are in short racemes at the tips of the branches. The cylindrical pistillate catkins are 3 to 3.5 centimeters long. (Adapted from *Gartenflora, vol. 36, p. 383.*)

52934. CLEMATIS MONTANA RUBENS Wilson. Ranunculaceæ.

A plant of exceptional beauty with rose-colored flowers 1½ to 2 inches in diameter, which are produced freely when the plant is only a foot high. It requires no background to show it to advantage, as in the case of the white flowers of the type, and is most suitable for training over old stumps, etc. Most of the flowers are produced in late May and June, and odd flowers continue to develop all summer. (Adapted from *The Garden, vol. 77, p. 84.*)

For previous introduction, see S. P. I. No. 52630.

52935. COTONEASTER ACUTIFOLIA VILLOSULA Rehd. and Wils. Malaceæ.

A very vigorous shrub 5 to 7 feet high, native to western Hupeh, with young shoots clothed with yellowish gray loose hairs, becoming smooth and purplish brown the second year. The leaves are 1½ to 4½ inches long, and the white flowers are rose tinted. The woolly, roundish, pear-shaped fruits are ultimately shining black. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 158.*)

52936. DAVIDIA INVOLUCRATA VILMORINIANA (Dode) Hemsl. Cornaceæ.

A tree 40 to 50 feet tall, native to western China, with alternate, ovate, bright-green leaves 2 to 4 inches long, inconspicuous flowers in terminal globular heads, and greenish yellow fruits with brown dots, nearly 2 inches long. The bracts are as in the typical form. (Adapted from *Curtis's Botanical Magazine, pl. 8432.*)

Received as *D. laeta*, which is now referred to this form.

For previous introduction, see S. P. I. No. 49669.

52937. HYDRANGEA PETIOLARIS Sieb. and Zucc. Hydrangeaceæ.

A hardy deciduous climber with deeply serrated, somewhat heart-shaped leaves about 4 inches long. The large flat corymbs, often 10 inches across, are composed mainly of small fertile blossoms which are inconspicuous and a few large white sterile blooms. As the number of showy flowers is small, the plant is not to be recommended as a wall climber, but as a tree climber, for clothing the trunks with foliage and flower, it can not be surpassed. It clings to the tree with rootlets thrown out from its lengthening growths and requires no wire or string. One plant ascended 40 feet in 13 years. (Adapted from *The Garden, vol. 64, p. 219.*)

52938. PYRACANTHA GIBBSII A. Jackson. Malaceæ.

A western Chinese shrub, up to 14 feet high, nearly spineless, with large, ovate-oblong, very variable leaves up to 3 inches long, white flowers, and scarlet, globular, abundant fruits about one-third of an inch in diameter. The leaves are commonly used for tea by the Chinese. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 16, p. 309.*)

For previous introduction, see S. P. I. No. 44399.

52928 to 52951—Continued.

52939 to 52951. RUBUS spp. Rosaceæ. **Bramble.**

52939. RUBUS ADENOPHORUS Rolfe.

A very distinct species with thick, armed stems, hairy flowering branches, and stipitate purple glands of unequal length. The hairy leaves are ternated (or the upper ones rarely simple) and green on both surfaces. The rachis, peduncles, and sepals are hairy, glandular, and a beautiful purple. The sepals recall a pincushion stuck full of black-headed pins. This glandular development extends to the stems and petioles. The rose-colored flowers with petals 5 millimeters long, are in 6 to 10 flowered racemes 3 to 4 centimeters long. The black edible fruit is 1 centimeter wide. (Adapted from *Kew Bulletin of Miscellaneous Information, 1910, p. 382.*)

For previous introduction, see S. P. I. No. 29975.

52940. RUBUS ALLEGHANIENSIS Porter.

One of the numerous forms of the cultivated blackberry, often known as *Rubus nigrobaccus* but apparently only a more or less stable form of *R. alleghaniensis.*

52941. RUBUS BIFLORUS QUINQUEFLORUS Focke.

A large, vigorous-growing bush with attractive, stout, "whitewashed" stems 12 to 15 feet in height and ornamental foliage. This plant produces rich, golden yellow, raspberrylike fruits of pleasant flavor which may prove of considerable value in the hands of the hybridist. (Adapted from *The Garden, vol. 76, p. 624.*)

For previous introduction, see S. P. I. No. 50294.

52942. RUBUS CHROOSEPALUS Focke.

The most valuable feature of this species is the very ornamental evergreen foliage, which may be compared with that of a lime tree. The slender stems, furnished with a few spines, grow 6 to 7 feet in a season. The simple cordate leaves, 4 inches long and 3½ inches wide, are glabrous above and white beneath. The flowers are borne in large panicles and have no decorative value; the fruits are small and blue. Native to Hupeh and Ichang at altitudes of 4,000 feet. The best use for the plant is to cover a pillar, pergola, or fence. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 51, p. 166.*)

52943. RUBUS FLOSCULOSUS Focke.

A deciduous shrub up to 12 feet high, with stout erect stems arching at the much-branched top. The pinnate leaves 4 to 7 inches long are smooth above and covered beneath with a close white felt. The small pink flowers in narrow racemes 2 to 4 inches long are followed by small, very dark red or black fruits which are good eating. Native to central and western China. (Adapted from *Wilson, A Naturalist in Western China, vol. 2, p. 31.*)

For previous introduction, see S. P. I. No. 50296.

52944. RUBUS GIRALDIANUS Focke.

A deciduous Chinese bramble with ornamental foliage and attractive slender white stems. To get the best effect, at least 8 or 10 plants should be grouped together and the old growths cut out in autumn to expose the full beauty of the previous summer's shoots. (Adapted from *The Garden, vol. 76, p. 624.*)

For previous introduction, see S. P. I. No. 50297.

52945. RUBUS INOPERTUS Focke.

A climbing shrub with strong stems and ovate leaflets green on each surface. The short-pediceled flowers are axillary and clustered at the tips of the branches. Native to southern and central China at altitudes of 2,000 meters. (Adapted from *Bibliotheca Botanica (Species Ruborum), vol. 72, p. 182.*)

52928 to 52951—Continued.

52946. RUBUS LASIOSTYLUS Focke.

A stout, hardy plant, 4 to 12 feet high, strikingly ornamental with its thick, very spiny stems of a peculiar whitened character. The pinnate leaves are dark green above and silvery white beneath; when young, the leafstalks and veins are suffused with rose. The magenta-red flowers are followed by curious white woolly fruits which are sweet to the palate and said to be used for food in China, where it is native. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 31, p. 167,* and *Gardening Illustrated, vol. 28, p. 631.*)

For previous introduction, see S. P. I. No. 50298.

52947. RUBUS LASIOSTYLUS DIZYGOS Focke.

A shrub native to the uplands of western Hupeh at an altitude of 1,600 meters, with 5-pinnate leaves of the fertile branches and rose-colored flowers. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 53.*)

For previous introduction, see S. P. I. No. 44402.

52948. RUBUS PARVIFOLIUS L.

An East Asian and Australian plant which produces much finer fruit in the mountains of Australia than in the lowlands. It extends as a native to Japan. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 477.*)

For previous introduction, see S. P. I. No. 50301.

52949. RUBUS PHOENICOLASIUS Maxim. **Wineberry.**

A tall subscandent singularly handsome bramble with slender branches, native to Japan. The peduncles and calyx are clothed with close-set, long-spreading, stiff, gland-tipped, red-purple hairs which in the lower part of the stem are glandless and mixed with slender, straight, or recurved prickles. The pinnately 3-foliolate leaves are 5 to 7 inches long. The leaflets are green and glabrous above and covered with snow-white tomentum beneath. The flowers have minute pale rose-red petals and spreading narrowly lanceolate sepals 1 inch long. The ovoid-oblong fruits, three-fourths of an inch long, made up of about 40 scarlet glabrous drupes, are edible but mawkish. (Adapted from *Curtis's Botanical Magazine, pl. 6479.*)

For previous introduction, see S. P. I. No. 50302.

52950. RUBUS PUBESCENS Weihe.

A very robust bramble native to Europe, with strong canes which, however, do not ascend to any considerable height without support. The fruit is well developed and pleasantly flavored.

For previous introduction, see S. P. I. No. 50303.

52951. RUBUS XANTHOCARPUS Bur. and Franch.

A trailing Chinese bramble with large ovate bright-yellow fruits which are fragrant and palatable.

For previous introduction, see S. P. I. No. 50305.

52952 to 52954.

From South America. Seeds presented by J. B. Mertie, jr., United States Geological Survey. Received April 7, 1921.

52952. LUFFA CYLINDRICA (L.) Roemer. Cucurbitaceæ.
(*L. aegyptiaca* Mill.)

Esponja de aire.

52953 and 52954. RICINUS COMMUNIS L. Euphorbiaceæ. **Castor-bean.**

52953. Large. 52954. Small.

52955. CALAMAGROSTIS COARCTATA (H. B. K.) Steud. Poaceæ. **Grass.**

From Sydney, New South Wales. Seeds presented by George Valder, undersecretary, Department of Agriculture. Received April 7, 1921.

An erect, cespitose grass, about a foot high, from cold mountainous regions in Ecuador and Colombia at an altitude of about 8,500 feet. The root is fibrous, and the leaves are very narrow. (Adapted from *Humboldt, Bonpland, und Kunth, Nova Genera et Species Plantarum, vol. 1, p. 143.*)

52956 to 53005. TRITICUM spp. Poaceæ. **Wheat.**

From Buenos Aires, Argentina. Seeds presented by the Cereal Exchange. Received April 8, 1921. Quoted notes by the Cereal Exchange.

Introduced for the Office of Cereal Investigations.

52956 to 52999. TRITICUM AESTIVUM L. (*T. vulgare* Vill.) **Common wheat.**

52956 to 52970. "*Barletta.*"

52956. "From southern Buenos Aires."

52957. "From eastern Buenos Aires."

52958. "From eastern Buenos Aires."

52959. "From eastern Buenos Aires."

52960. "From eastern Buenos Aires."

52961. "From eastern Buenos Aires."

52962. "From eastern Buenos Aires."

52963. "From eastern Buenos Aires."

52964. "From eastern Buenos Aires."

52965. "From eastern Buenos Aires."

52966. "From northern Pampa Central."

52967. "From central Pampa Central."

52968. "From southern Santa Fe."

52969. "From eastern Entre Rios."

52970. "From southern Cordoba."

52971 to 52976. "*Pampa.*"

52971. "From central Pampa Central."

52972. "From northern San Luis."

52973. "From eastern Buenos Aires."

52974. "From southern Buenos Aires."

52975. "From northern Pampa Central."

52976. "From southern Cordoba."

52977 to 52984. "*Hungaro.*"

52977. "From northern Pampa Central."

52978. "From eastern Buenos Aires."

52979. "From southern Santa Fe."

52980. "From southern Cordoba."

52981. "From southern Cordoba."

52982. "From southern Buenos Aires."

52983. "From eastern Buenos Aires."

52984. "From southern Buenos Aires"

52956 to 53005—Continued.

52985 to 52987. "*Ruso.*"

52985. "From eastern Buenos Aires."

52986. "From eastern Buenos Aires."

52987. "From southern Pampa Central."

52988 to 52994. "*Ricti.*"

52988. "From central Pampa Central."

52989. "From eastern Buenos Aires."

52990. "From eastern Buenos Aires."

52991. "From northern Buenos Aires."

52992. "From southern Cordoba."

52993. "From northern Pampa Central."

52994. "From southern Buenos Aires."

52995. "*Chubut*, from southern Buenos Aires."

For previous introduction, see S. P. I. No. 5464.

52996. "*Tuzulla*, from central Cordoba."

52997. "*Frances*, from eastern Buenos Aires."

For previous introduction, see S. P. I. No. 5466.

52998. "*Australiano*, from northern Pampa Central."

52999. "*Australiano*, from northern Pampa Central."

53000 to 53005. TRITICUM DURUM Desf. Poaceæ. **Durum wheat.**

53000. "*Candeal*, from southern Buenos Aires."

For previous introduction, see S. P. I. No. 41402.

53001. "*Candeal*, from eastern Buenos Aires."

For previous introduction, see S. P. I. No. 41402.

53002. "*Candeal* (*R*), from the Province of Mendoza."

53003. "*Candeal* (*R*), from the Province of Mendoza."

53004. "*Taganrog*, from eastern Buenos Aires."

For previous introduction, see S. P. I. No. 41043.

53005. "*Taganrog*, from eastern Buenos Aires."

For previous introduction, see S. P. I. No. 41043.

53006. DIOSCOREA ROTUNDATA Poir. Dioscoreaceæ. **Guinea yam.**

From Mayaguez, Porto Rico. Tubers presented by T. B. McClelland, horticulturist, Agricultural Experiment Station. Received April 28, 1921.

"A white-fleshed yam of excellent quality, and one of the most popular varieties grown in Porto Rico. The tubers are usually cylindrical, commonly weighing from 3 to 6 pounds each at maturity." (*R. A. Young.*)

53007. TRIFOLIUM GLOMERATUM L. Fabaceæ. **Cluster clover.**

From Melbourne, Victoria, Australia. Seeds presented by F. H. Brunning. Received April 29, 1921.

A valuable annual which seeds freely and so maintains itself even on dry sandy soils. It is a splendid plant for improving bare arid pasture lands, which it greatly enriches, thereby adding to the carrying capacity. The clover spreads rapidly and yields an abundance of good pasturage.

For previous introduction, see S. P. I. No. 52356.

53008. MALUS DOUMERI (Bois) Cheval. Malaceæ. **Tonking apple.**

From Laos, Indo China. Seeds presented by R. Miéville, director, Station Agricole du Tranninh, Chieng Khuang, through M. Auguste Chevalier, Agronomie Coloniale, Ecole Pratique des Hautes Etudes, Paris, France. Received April 25, 1921.

"An interesting wild apple native to the high plateaus of French Indo China, at altitudes of 800 to 2,000 meters (2,600 to 6,500 feet), notably on Langbian and the lesser mountain ranges. It is a large tree which produces fruits similar in form, flavor, and color to certain varieties of Normandy cider pears.

"Although the species grows in the open forest and is uncared for by the present mountaineers, it must have been cultivated and improved at some ancient time. There remain specimens cultivated as sacred trees around certain Laos pagodas; here the trees were cared for by priests." (*Chevalier.*)

53009 to 53030. ASTER spp. Asteraceæ. **Aster.**

From Elstree, Herts, England. Plants presented by Hon. Vicary Gibbs, Aldenham House Gardens. Received April 20, 1921.

53009 to 53029. ASTER NOVI-BELGII L.

53009. *Belgian Queen.* An excellent, much-branched, late-blooming variety 6½ feet high, with well-clothed flowering sprays which are very beautiful on the bush or in a vase. The flowers are rich blue-purple, and the disk keeps yellow, which is a valuable asset. (Adapted from *The Garden, vol. 84, p. 610,* and from *Country Life, vol. 45, p. 376.*)

53010. *Bluebeard.* A light, graceful variety, 6 feet high, with pretty, soft-blue flowers. (Adapted from *The Garden, vol. 84, p. 610,* and from *Country Life, vol. 45, p. 376.*)

53011. *Blue Gem.* The bluest purple of any Michaelmas daisy known. (Adapted from *The Garden, vol. 84, p. 610.*)

53012. *Blushing Bride.* A variety with flowers of a very pale pink. (Adapted from *The Garden, vol. 84, p. 610.*)

53013. *Brightest and Best.* A very effective variety 4 feet high, with a remarkably handsome habit and magenta flowers. (Adapted from *The Garden, vol. 84, p. 610,* and from *Country Life, vol. 45, p. 376.*)

53014. *Brussels.* Reported as a variety of good habit and vigorous constitution, which reaches a height of 4 feet and bears enormous, single, pale-lavender flowers in graceful sprays.

53015. *Captain Fryatt.* Said to be one of the best of the pale mauves, 4½ feet high, of free growth and excellent for cutting.

53016. *Climax.* A beautiful new variety said to be 5 feet high, with large lavender flowers 2 inches across.

53017. *General Leman.* A variety with flowers of the purest deep rose without any blue in it. This color is superb under artificial light. (Adapted from *The Garden, vol. 84, p. 610.*)

53018. *Ghent.* Reported as a fine pale-pink variety.

53019. "*Joan Vaughan.* A new seedling aster." (*Gibbs.*)

53020. *Liege.* A good light-pink variety, very free flowering.

53021. *Malines.* A blue-flowered variety of great merit. (Adapted from *Country Life, vol. 45, p. 376.*)

53022. *Mons.* A most distinct and remarkably beautiful variety, 3 to 4 feet high, forming sharply rounded bushes completely covered with deep-pink single flowers which all open at the same time. This fine, healthy, sturdy variety is fairly early and has a long flowering period. The color is superb under artificial light. (Adapted from *Gardeners' Chronicle, vol. 68, p. 285,* and from *The Garden, vol. 84, p. 610.*)

53023. "*Namur.* A new seedling aster." (*Gibbs.*)

53009 to 53030—Continued.

53024. *Nurse Carell.* A soft-pink variety said to be 4½ feet high, of excellent quality and very free flowering.

53025. "*President.* A new seedling aster." (*Gibbs.*)

53026. "*Robinson V. C.* A new seedling aster." (*Gibbs.*)

53027. *Sam Banham.* A pure-white seedling from *Climax*, reported as identical with that variety except in color; excellent for cutting.

53028. "*The Queen.* A new seedling aster." (*Gibbs.*)

53029. *Ypres.* A variety with a stiff bushlike habit and pale-pink flowers. (Adapted from *The Garden, vol. 84, p. 610.*)

This variety is said to be 3 feet high, of very free growth, and the flowers have a fine yellow eye.

53030. ASTER VIMINEUS Lam. Asteraceæ. **Aster.**

"*Desire.* A new seedling aster." (*Gibbs.*)

53031 to 53080.

From Copenhagen, Denmark. Seeds presented by Axel Lange, curator, Botanic Garden of the University. Received April 28, 1921.

Introduced for experiments with leaf rusts of grains and grasses.

53031. AGROPYRON OBTUSIUSCULUM Lange. Poaceæ. **Wheat-grass.**

A perennial grass native to the temperate regions of both hemispheres.

53032. ALKANNA LUTEA (Desr.) A. DC. Boraginaceæ. **Yellow alkanet.**

A hardy European plant with golden yellow trumpet-shaped flowers, somewhat resembling *Anchusa italica* except in flower color.

Received as *Nonnea lutea*, which is now referred to *Alkanna lutea*.

53033. BAPTISIA AUSTRALIS (L.) R. Br. Fabaceæ.

A handsome, stout, perennial herb 4 to 6 feet high, native to eastern North America, with lupinelike indigo-blue flowers an inch long in loose-flowered, long, terminal racemes.

For previous introduction, see S. P. I. No. 4784.

53034. BERBERIS ARISTATA DC. Berberidaceæ. **Barberry.**

A Himalayan shrub 8 feet high, which bears stout spreading racemes of sessile bright-red berries which finally become bluish purple and bloomy.

53035. BERBERIS LYCIUM Royle. Berberidaceæ. **Barberry.**

A Himalayan shrub 6 feet high, bearing violet fruits in sessile racemes.

For previous introduction, see S. P. I. No. 49928.

53036. BROMUS ADOENSIS Hochst. Poaceæ. **Brome-grass.**

An Abyssinian plant about 1 to 2 feet high with softly hairy foliage and nodding panicles, 3 to 5 inches long, of shining awned spikelets.

53037. BROMUS LACINIATUS Beal. Poaceæ. **Brome-grass.**

A tall smooth perennial with large open drooping panicles of large spikelets.

53038. BROMUS RACEMOSUS L. Poaceæ. **Brome-grass.**

Chess or *cheat*, a smooth weed of waste places, introduced from Europe, sometimes infesting grain fields. It is 1 to 3 feet tall.

53039. CERINTHE MAJOR L. Boraginaceæ. **Honeywort.**

A showy annual 6 to 15 inches high with very rough leaves and flowers that are yellow below and purplish above, bearing showy bracts.

53031 to 53080—Continued.

53040. CLEMATIS GRAVEOLENS Lindl. Ranunculaceæ. **Clematis.**

A rapid climber found from the Himalayan region to Persia, bearing thin, pinnate, shiny leaves and cymes of yellow flowers, 1½ inches across, tinted with green.

For previous introduction, see S. P. I. No. 30765.

53041. CLEMATIS RETICULATA Walt. Ranunculaceæ. **Clematis.**

A slender climber native to the United States from South Carolina to Alabama and Florida, which bears very coriaceous reticulated leaves and solitary, axillary, nodding bell-shaped flowers.

For previous introduction, see S. P. I. No. 11557.

53042. CLEMATIS VITALBA L. Ranunculaceæ. **Clematis.**

The most vigorous climber of the genus, ascending to 30 feet. It is native to Europe, northern Africa, and the Caucasus; and bears axillary panicles of dull-white flowers followed by fruits with long feathery styles from which it is called "old man's beard."

53043. CLEMATIS VITICELLA L. Ranunculaceæ. **Clematis.**

The type of one of the leading groups of garden clematis, and one of the parents of the Jackmanii type of hybrids. It climbs to a height of 12 feet; bears entire or 3-parted leaves and blue or purple flowers up to 2 inches in diameter growing singly or in threes. Native to southern Europe.

For previous introduction, see S. P. I. No. 49810.

53044. DELPHINIUM CONSOLIDA L. Ranunculaceæ. **Larkspur.**

An erect hairy European annual 1 to 1½ feet high, with blue or white flowers in loose panicles.

53045. DOLICHOS LABLAB L. Fabaceæ. **Bonavist bean.**

An annual ornamental tropical bean climbing to a height of 20 feet, with long erect racemes of rather large purple or white flowers; the pods and seeds are eaten in the Tropics.

53046. ELYMUS ARENARIUS L. Poaceæ. **Lyme-grass.**

A stout coarse perennial native to the temperate regions of both hemispheres. It is used for binding coast sands. The seed is used by the Digger Indians for food.

Received as *Elymus geniculatus*, which is now referred to *E. arenarius*.

For previous introduction, see S. P. I. No. 24473.

53047. ELYMUS CAPUT-MEDUSAE L. Poaceæ. **Lyme-grass.**

An erect annual introduced from Europe.

53048. ELYMUS EUROPAEUS L. Poaceæ. **Lyme-grass.**

A tall European perennial with lax flat blades about half an inch wide and a narrow nodding bristly head 5 to 8 inches long.

Received as *Hordeum europaeum*, which is now referred to *Elymus europaeus*.

53049. ELYMUS GIGANTEUS Vahl. Poaceæ. **Lyme-grass.**

A grass native to Russia and Siberia.

53050. ELYMUS HIRSUTIGLUMIS Scribn. Poaceæ. **Lyme-grass.**

Southern wild rye, a grass with stout erect culms 3 to 5 feet high and ascending rough-hairy leaves 8 to 12 inches long.

53051. ELYMUS SIBIRICUS L. Poaceæ. **Lyme-grass.**

A tall grass with heavy overhanging heads found on fertile flats in higher mountain regions of Chihli Province, China. Of value possibly for grazing.

For previous introduction, see S. P. I. No. 36794.

53031 to 53080—Continued.

53052. ELYMUS VIRGINICUS SUBMUTICUS Hook. Poaceæ. **Lyme-grass.**

A coarse, Rocky Mountain perennial growing on rich low ground. It affords good pasturage and makes a coarse hay.

53053. ERANTHIS HYEMALIS (L.) Salisb. Ranunculaceæ. **Winter aconite.**

An erect perennial hardy herb 5 to 8 inches high, naturalized from Europe. Very desirable for half-shady places for its early show of bright-yellow flowers.

53054. HELLEBORUS FOETIDUS L. Ranunculaceæ. **Hellebore.**

A western European species with true stem 1 foot high, coriaceous leaves, and sepals green or bordered with bright purple, under 1 inch long.

53055 and 53056. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

53055. A tall grass native to the United States, cultivated since prehistoric times for the seed, which has been used for food, for the sweet juice, and for forage.

53056. A tall grass native to the United States, with flat blades and terminal panicles, cultivated for the edible seed, for the sweet juice, and for forage.

53057. HORDEUM NODOSUM L. Poaceæ. **Barley.**
(*H. secalinum* Schreb.)

A perennial grass abundant throughout the western half of the United States.

For previous introduction, see S. P. I. No. 43314.

53058. MILIUM EFFUSUM L. Poaceæ. **Millet grass.**

The only representative of the genus in America, a slender erect perennial 3 to 4 feet tall, found in the cool woods from Nova Scotia to Illinois.

53059. MYOSOTIS ARVENSIS (L.) Hill. Boraginaceæ. **Forget-me-not.**

An annual or biennial erect plant 7 to 20 inches high, native to Europe and Asia, which bears blue or white flowers.

53060. MYOSOTIS SCORPIOIDES L. Boraginaceæ. **Forget-me-not.**
(*M. palustris* Lam.)

The true forget-me-not of Europe and Asia, 6 to 18 inches high. The bright-blue flowers have a yellow eye.

53061. NIGELLA DAMASCENA L. Ranunculaceæ. **Love-in-a-mist.**

A hardy southern European annual 1 to 2 feet high, bearing bright-green finely cut leaves and large white or blue flowers with a very dense and fine involucre.

53062. NONNEA ROSEA (Bieb.) Link. Boraginaceæ. **Rose alkanet.**

For previous introduction, see S. P. I. No. 52883.

53063. PENNISETUM GLAUCUM (L.) R. Br. Poaceæ. **Pearl millet.**
(*P. typhoideum* Pers.)

A robust tropical annual 4 to 8 feet tall, with broad blades and a dense spikelike panicle 1 foot long. It is cultivated for the edible seed, for forage, and for soiling.

53064. POA ALPINA L. Poaceæ. **Spear-grass.**

A good pasture grass native to Kazan Province of the northern Volga region of European Russia.

For previous introduction, see S. P. I. No. 20618.

53031 to 53080—Continued.

53065. POA CAESIA J. E. Smith. Poaceæ. **Spear-grass.**

A glaucous Eurasian perennial with rather rigid culms 1.5 to 6 decimeters high and rather compact panicles 3 to 7 centimeters long.

53066. POA CHAIXII Vill. Poaceæ. **Spear-grass.**

A tall relatively coarse species, with rather broad blades and drooping panicles. Native to Europe and Asia Minor.

For previous introduction, see S. P. I. No. 16806.

53067. POLYPOGON MONSPELIENSIS (L.) Desf. Poaceæ. **Beard-grass.**

A common annual weed on the Pacific coast, with bristly green or yellowish spikes 1 to 6 inches long.

53068. SALVIA PRATENSIS L. Menthaceæ. **Sage.**

A hardy European perennial 2 feet high, with more or less blood-red maculate leaves and bright-blue or rarely reddish or white flowers 1 inch long.

53069. SECALE FRAGILE Bieb. Poaceæ. **Rye.**

A bearded grass native to the sandy steppes of Hungary and southern Russia.

53070. SIDALCEA MALVAEFLORA (DC.) A. Gray. Malvaceæ.

An erect or ascending hardy perennial 1 to 6 feet high, with small incised-crenate leaves and purple flowers 2 inches across. Native to California.

53071. STIPA CAPILLATA L. Poaceæ. **Feather grass.**

A perennial European, ornamental grass less than 2 feet high, used in the making of dry bouquets.

For previous introduction, see S. P. I. No. 20686.

53072. STIPA PENNATA L. Poaceæ. **Feather grass.**

An ornamental grass native to the steppes of Europe and Siberia. The culms are 2 to 3 feet high and occur in bunches. The panicles are very plumose.

For previous introduction, see S. P. I. No. 30609.

53073. THALICTRUM FLAVUM L. Ranunculaceæ. **Meadow rue.**

A European stout perennial herb 2 to 4 feet high, with large compound leaves and pale-yellow flowers with bright-yellow anthers.

53074 and 53075. THALICTRUM FLEXUOSUM Bernh. Ranunculaceæ. **Meadow rue.**

53074. A yellow-flowered perennial 1½ feet high, native to Germany.

53075. Received as *Thalictrum jacquinianum*, for which *T. flexuosum* is an earlier name.

53076. THALICTRUM FOETIDUM L. Ranunculaceæ. **Meadow rue.**

A white or yellow-flowered perennial three-fourths of a foot high, native to France.

53077. TRITICUM BICORNE Forsk. Poaceæ. **Wild wheat.**

A tufted annual, native to Egypt and Syria, with culms 30 to 60 centimeters high.

53078. TRITICUM DICOCCUM Schrank. Poaceæ. **Emmer.**

Supposed to be the original parent of all wheats in the world. It has great drought-resisting qualities and should do well in the arid tracts of the southern United States.

Received as *Triticum amyleum*, which is now referred to *T. dicoccum*.

For previous introduction, see S. P. I. No. 34369.

53031 to 53080—Continued.

53079. TRITICUM AESTIVUM × OVATUM. Poaceæ. **Hybrid wheat.**
(*Aegilops triticoides* Req.)

A European annual 2 feet high with narrow cylindrical spikes of closely appressed awned spikelets.

53080. VIGNA CYLINDRICA (Stickm.) Skeels. Fabaceæ. **Catjang.**

A crop grown for its seeds and also used as a string bean in India.

Received as *Dolichos catjang*, which is now referred to *Vigna cylindrica*.

For previous introduction, see S. P. I. No. 35349.

53081 to 53114.

From Leyden, Netherlands. Seeds presented by Prof. Dr. J. M. Janse, director, Botanic Garden. Received April 15, 1921.

Introduced for experiments with leaf rusts of grains and grasses.

53081. ACONITUM LYCOCTONUM L. Ranunculaceæ. **Monkshood.**

A slender-stemmed perennial 3 to 6 feet high, native to Europe and Siberia, with deeply cut leaves and yellow or whitish flowers.

53082. ACONITUM NAPELLUS L. Ranunculaceæ. **Monkshood.**

The best known and most poisonous species of Aconitum; it is used in medicines. The erect stem is 3 to 4 feet high and the flowers blue. Native to the temperate north.

For previous introduction, see S. P. I. No. 20881.

53083. ACONITUM PANICULATUM Lam. Ranunculaceæ. **Monkshood.**

A European blue-flowered species.

53084. AGROPYRON CANINUM (L.) Beauv. Poaceæ. **Wheat-grass.**

A grass common in timber and timber clearings near Chita, Transbaikal region of eastern Siberia.

For previous introduction, see S. P. I. No. 24475.

53085. AGROPYRON ELONGATUM (Host.) Beauv. Poaceæ. **Wheat-grass.**
(*A. rigidum* Beauv.)

A perennial grass 1½ to 2 feet high, with rough linear leaves. Native to the sandy coasts of the Mediterranean and the alpine summits of Lebanon.

For previous introduction, see S. P. I. No. 17827.

53086. ANTIRRHINUM ORONTIUM L. Scrophulariaceæ. **Snapdragon.**

A slender annual, native to North America, 6 to 12 inches high, with small purple or white flowers.

53087. AQUILEGIA FRAGRANS Benth. Ranunculaceæ. **Columbine.**

A Himalayan plant 6 inches high, with yellow-striped flowers.

53088. ARRHENATHERUM ELATIUS (L.) Beauv. Poaceæ. **Tall oat-grass.**
(*A. avenaceum* Beauv.)

"This is occasionally cultivated in the humid regions of the United States as a meadow grasss under the name of tall oat-grass. It is a fairly satisfactory forage grass." (*A. S. Hitchcock.*)

53089. BERBERIS CRATAEGINA DC. Berberidaceæ. **Barberry.**

A deciduous shrub 5 feet high, with 6 to 10 flowered racemes 1 to 2 inches long and bluish black fruits. Native to Asia Minor.

53081 to 53114—Continued.

53090. BERBERIS HOOKERI Lem. Berberidaceæ. **Barberry.**
(*B. wallichiana* Hook., not DC.)

A deciduous shrub 5 feet high, native to Asia Minor, bearing bluish black fruits.

Received as *B. macrophylla*, which is a horticultural name for *B. hookeri*.

For previous introduction, see S. P. I. No. 49618.

53091. BORAGO OFFICINALIS L. Boraginaceæ. **Borage.**

A coarse hairy annual native to Europe and northern Africa, 2 feet high. The handsome blue flowers make it a widely known bee plant, and the young leaves are used as a potherb and in salad.

53092. BROMUS RIGIDUS Roth. Poaceæ. **Brome-grass.**

A weedy annual 2 feet tall, with hairy foliage and drooping panicles of long awned spikelets. Native to the Mediterranean region and naturalized in the United States.

53093. CERINTHE ALPINA Kit. Boraginaceæ. **Honeywort.**

A perennial with a recurved spike of 5-parted bell-shaped flowers. Native to the Alps and descending along the streams into the plains.

53094. CERINTHE MAJOR L. Boraginaceæ. **Honeywort.**

An ornamental annual 6 to 15 inches high, with showy bracted flowers yellow below and purplish above.

For previous introduction, see S. P. I. No. 53039.

53095. CERINTHE MINOR L. Boraginaceæ. **Honeywort.**

A European plant with yellow or purple-spotted flowers in long racemes.

For previous introduction, see S. P. I. No. 49867.

53096. CLEMATIS VITICELLA L. Ranunculaceæ. **Clematis.**

A southern European clematis which climbs to a height of 12 feet and bears entire or 3-parted leaves and single or 3-clustered blue or purple flowers up to 2 inches across.

For previous introduction, see S. P. I. No. 49810.

53097. DELPHINIUM AMOENUM Stev. Ranunculaceæ. **Larkspur.**

A pale blue-flowered perennial native to Siberia. Flowers in July.

53098. DELPHINIUM CASHMERIANUM Royle. Ranunculaceæ. **Larkspur.**

A Himalayan plant 10 to 18 inches high, with deep azure-blue flowers 2 inches long.

53099. DELPHINIUM ELATUM L. Ranunculaceæ. **Larkspur.**

A European species 2 to 6 feet high, bearing blue flowers with dark-violet petals.

For previous introduction, see S. P. I. No. 13685.

53100. ELYMUS DESERTORUM Kar. and Kir. Poaceæ. **Lyme-grass.**

A grass with flat blades with incurved margins and elongated spikes. Native to Siberia.

53101. HELLEBORUS FOETIDUS L. Ranunculaceæ. **Hellebore.**

A western European species with true stem 1 foot high and green or purple-bordered sepals 1 inch long.

For previous introduction, see S. P. I. No. 53054.

53102 to 53104. HORDEUM DISTICHON PALMELLA Harlan. Poaceæ. **Barley.**

53102. A cultivated variety of 2-rowed barley. Received as *H. distichon*.

53081 to 53114—Continued.

53103. A cultivated variety of 2-rowed barley. Received as *H. distichon nutans.*

53104. A cultivated variety of 2-rowed barley. Received as *H. zeocriton.*

53105. HORDEUM VULGARE TRIFURCATUM (Schlecht.) Beaven. Poaceæ. **Barley.**

A trifurcate, naked, 6-rowed, white, blue, or purple kerneled subspecies, the parent form of trifurcate barleys. Received as *H. aegyceras.*

53106. NIGELLA DAMASCENA L. Ranunculaceæ. **Love-in-a-mist.**

A hardy, southern European annual 1 to 2 feet high, bearing large white or blue flowers.

For previous introduction, see S. P. I. No. 53061.

53107. NONNEA ROSEA (Bieb.) Link. Boraginaceæ. **Rose alkanet.**

An attractive hardy procumbent annual native to the northern Caucasus. The white or purple flowers are funnel shaped.

For previous introduction, see S. P. I. No. 53062.

53108. RANUNCULUS AURICOMUS L. Ranunculaceæ. **Crowfoot.**

A hardy herbaceous perennial 1¼ feet high, with yellow flowers.

53109. SYMPHYTUM OFFICINALE L. Boraginaceæ. **Comfrey.**

A hardy tuberous-rooted perennial 3 feet high, with white, yellowish, purple, or rose flowers in drooping cymes. Native to Europe and Asia.

53110. THALICTRUM ANGUSTIFOLIUM L. Ranunculaceæ. **Meadow rue.**

A hardy herbaceous, yellow-flowered perennial 3 feet high, beautiful as a background for the herbaceous border. Native to Germany.

For previous introduction, see S. P. I. No. 49869.

53111. THALICTRUM DIPTEROCARPUM Franch. Ranunculaceæ. **Meadow rue.**

An erect perennial Chinese herb with large rose-colored flowers and pale-green leaflets, glaucous below.

53112. THALICTRUM FLAVUM L. Ranunculaceæ. **Meadow rue.**

A stout European perennial herb 2 to 4 feet high, bearing pale-yellow flowers with bright-yellow anthers.

For previous introduction, see S. P. I. No. 53073.

53113. TRITICUM BICORNE Forsk. Poaceæ. **Wild wheat.**

A tufted annual with culms 2½ feet long, native to Egypt and Syria.

For previous introduction, see S. P. I. No. 53077.

53114. TRITICUM SPELTA L. Poaceæ. **Spelt.**

The most popular wheat of antiquity and a favorite now in Germany and Switzerland, especially in poor soils. It is less susceptible to disease and to inroads by birds than the beardless varieties.

Received as *T. taanda,* but the sample is spelt.

For previous introduction, see S. P. I. No. 23898.

53115 to 53118.

From Hobart, Tasmania, Australia. Seeds collected by Victor O. Fletcher, Newnham Post Office, near Launceston, and presented by L. A. Evans, acting Director of Agriculture. Received April 30, 1921. Quoted notes by Mr. Evans.

"The soil here is very fertile, but the rainfall is only 14 inches, and we have no recognized rainy season."

53115. DANTHONIA SETACEA R. Br. Poaceæ. **Wallaby grass.**

"A valuable fodder plant if properly cultivated."

Wallaby grass, a perennial grass useful for artificial mixed pasture; it is principally valuable in the spring. (Adapted from *Maiden, Useful Native Plants of Australia, p. 82.*)

53116. FESTUCA BROMOIDES L. Poaceæ. **Fescue grass.**

A slender tufted annual up to 1 foot high, with a one-sided, slender panicle 2 to 6 inches long. (Adapted from *Bailey, Queensland Flora, pt. 6, p. 1917.*)

53117. POA sp. Poaceæ. **Spear grass.**

"Cattle grass."

53118. THEMEDA TRIANDRA Forsk. Poaceæ. **Rooi grass.**

One of the commonest grasses of the drier regions of Africa and a most valuable fodder grass. (Adapted from *Prain, Flora of Tropical Africa, vol. 9, pt. 3, p. 416.*)

For previous introduction, see S. P. I. No. 48787.

53119. MUSA sp. Musaceæ. **Banana.**

From Mount Silinda, Melsetter, Southern Rhodesia, Africa. Shoots presented by Dr. W. L. Thompson, American Board Mission in South Africa. Received May 4, 1921.

"A variety of banana, obtained from the natives, different from any I have ever seen elsewhere. We prize it for its eating qualities, although it is a poor yielder. We imagine that it may have a larger percentage of proteins than ordinary bananas, but have no real proof of it. It may require more tropical conditions for best development." (*Thompson.*)

53120 and 53121.

From Dibrugarh, Assam. Seeds collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received May 4, 1921. Quoted notes by Mr. Rock.

53120. CARYOTA sp. Phœnicaceæ. **Palm.**

"(Collected in Dibrugarh, along the Brahmaputra River, Assam, February 19, 1921.) This palm, 70 to 80 feet high, is cultivated in Dibrugarh and grows wild on the banks of the Brahmaputra near the Himalayan foothills. It is quite different from *Caryota urens*, especially in its stature; it is much taller, the trunk being 40 feet high. The leaves are shorter but are arranged spirally on the trunk, giving the whole palm a curious appearance. The palm does not die after flowering, as is the case with *C. urens*. The fruiting panicles are much shorter, and the fruits are yellowish when ripe."

53121. GYNOCARDIA ODORATA R. Br. Flacourtiaceæ. **False chaulmoogra tree.**

"(Collected in the Bherjan forest, 7 miles from Rangagora in northeastern Assam, February 22, 1921.) *Lemtam*. A tall, handsome tree found in certain forest tracts of northeastern Assam, with dark-green foliage and pendent branches. The trunk is often over a foot in diameter and 60 to 70 feet in height. The bark is lenticellate, while that of *Taraktogenos kurzii* is smooth. The large spherical depressed fruits are borne on the trunk and branches, while those of *T. kurzii*

53120 and 53121—Continued.

are borne on the ends of the branches in the leaf axils. The fruits are exceedingly fragrant when ripe and contain about twenty seeds embedded in shiny, sweet, yellowish pulp. Monkeys are very fond of the fruit flesh, and whole fruits are rarely found unless they be immature."

For previous introduction, see S. P. I. No. 51668.

53122 to 53175.

From Upsala, Sweden. Seeds presented by Dr. O. Juel, director, Botanical Garden. Received April 12, 1921.

Introduced for experiments with leaf rusts of grains and grasses.

53122. ACONITUM LYCOCTONUM L. Ranunculaceæ. **Monkshood.**

A slender perennial reaching a height of 6 feet, with yellow or whitish flowers. Native to Europe and Siberia.

For previous introduction, see S. P. I. No. 53081.

53123. ACONITUM SEPTENTRIONALE Koelle. Ranunculaceæ. **Monkshood.**

An Himalayan plant with pale-yellow or dull-purple flowers. This species yields much of the aconite of European commerce.

For previous introduction, see S. P. I. No. 51746.

53124. AGROPYRON VIOLACEUM (Hornem.) Lange. Poaceæ. **Wheat-grass.**

A perennial grass with culms usually decumbent at the base, 3 to 6 decimeters high. Native to Europe.

53125. AGROSTIS BOREALIS Hartm. Poaceæ. **Bent-grass.**

A European grass with tufted culms 1 to 4 decimeters high.

53126. ALKANNA LUTEA (Desr.) A. DC. Boraginaceæ. **Yellow alkanet.**

A hardy European herb with bluish, trumpet-shaped flowers. Received as *Nonnea lutea*, which is now referred to *Alkanna*.

For previous introduction, see S. P. I. No. 53032.

53127. ANTIRRHINUM ORONTIUM L. Scrophulariaceæ. **Snapdragon.**

A North American annual 6 to 12 inches high, bearing small purple or white flowers.

For previous introduction, see S. P. I. No. 53086.

53128. AQUILEGIA ATRATA Koch. Ranunculaceæ. **Columbine.**

A hardy perennial, native to Europe and Siberia, reaching 2 feet in height and with abundant violet flowers 1 inch long.

53129. AQUILEGIA VIRIDIFLORA Pall. Ranunculaceæ. **Columbine.**

A hardy perennial 1½ feet high, native to eastern Siberia and bearing several greenish flowers.

For previous introduction, see S. P. I. No. 42737.

53130. AVENA MONTANA Vill. Poaceæ. **Oat.**

A grass native to the Pyrenees Mountains.

53131. AVENA NUDA Hoejer. Poaceæ. **Oat.**

Hull-less oats cultivated in China for food and used for making flour.

For previous introduction, see S. P. I. No. 40650.

53132. AVENA STERILIS L. Poaceæ. **Oat.**

Animated oats, occasionally cultivated as a curiosity, the florets when moistened presenting spontaneous movements.

53133. AVENA STRIGOSA Schreb. Poaceæ. **Oat.**

A native of Europe and western Asia cultivated and occurring as a weed in cultivated fields.

For previous introduction, see S. P. I. No. 25364.

53122 to 53175—Continued.

53134. BRACHYPODIUM SYLVATICUM (Huds.) Beauv. Poaceæ. False brome-grass.

A grass native to woods and thickets throughout Europe and eastward through northern Asia to the Provinces of Shengking and Hupeh, China.

For previous introduction, see S. P. I. No. 32446.

53135. BROMUS BRIZAEFORMIS Fisch. and Mey. Poaceæ. Brome-grass.

A handsome ornamental grass 1 to 2 feet high with a one-sided nodding panicle. Native to the Caucasus and Persia.

For previous introduction, see S. P. I. No. 15978.

53136. CERINTHE ALPINA Kit. Boraginaceæ. Honeywort.

For previous introduction, see S. P. I. No. 53093.

53137. CLEMATIS ALPINA (L.) Mill. Ranunculaceæ. Clematis.

A slender plant 3 to 5 feet high, native to northwestern North America, Siberia, and southern Europe. The flowers are bright blue with many petallike stamens.

For previous introduction, see S. P. I. No. 5133.

53138. CLEMATIS ALPINA SIBIRICA (L.) Kuntze. Ranunculaceæ. Clematis.

A white-flowered form of *Clematis alpina*.

For previous introduction, see S. P. I. No. 237.

53139. CLEMATIS FLAMMULA L. Ranunculaceæ. Clematis.

A slender vigorous climber, native to the Mediterranean region. The dark-green leaves remain fresh until midwinter. The small numerous flowers are followed by white-plumed fruits.

For previous introduction, see S. P. I. No. 13925.

53140. CLEMATIS INTEGRIFOLIA L. Ranunculaceæ. Clematis.

A blue-flowered plant native to Hungary.

For previous introduction, see S. P. I. No. 49809.

53141. CLEMATIS PSEUDOFLAMMULA Schmalh. Ranunculaceæ. Clematis.

An herbaceous plant 1 to 2 feet high, growing in open fields in the northern Caucasus. The flowering season is May to June.

53142. DELPHINIUM CASHMERIANUM Royle. Ranunculaceæ. Larkspur.

For previous introduction, see S. P. I. No. 53098.

53143. DELPHINIUM ELATUM L. Ranunculaceæ. Larkspur.

Variety *intermedium*.

A variety of the polymorphous bee larkspur (see S. P. I. No. 53099).

53144. ELYMUS ARENARIUS L. Poaceæ. Lyme-grass.

A coarse perennial grass native to north temperate regions, used to bind coast sand.

For previous introduction, see S. P. I. No. 53046.

53145. ERANTHIS HYEMALIS (L.) Salisb. Ranunculaceæ. Winter aconite.

An erect European perennial 5 to 8 inches high, with bright-yellow flowers in early spring.

For previous introduction, see S. P. I. No. 53053.

53146. HELLEBORUS FOETIDUS L. Ranunculaceæ. Hellebore.

A western European species with a true stem a foot high, and green or purple-bordered sepals 1 inch long.

For previous introduction, see S. P. I. No. 53054.

53122 to 53175—Continued.

53147. HORDEUM SPONTANEUM C. Koch. Poaceæ. **Barley.**

An annular 2-rowed barley which is considered by some to be the wild form of the cultivated 2-rowed varieties. Native to the Caucasus.

For previous introduction, see S. P. I. No. 28885.

53148. LAPPULA MYOSOTIS Moench. Boraginaceæ. **Stickweed.**
(*Echinospermum lappula* Lehm.)

An erect grayish annual 5 to 6 decimeters high, with blue to whitish flowers. Naturalized from Europe.

53149. MELICA CILIATA L. Poaceæ. **Melic grass.**

A half-hardy, ornamental perennial grass native to Europe and northern Africa.

For previous introduction, see S. P. I. No. 16967.

53150. MELICA NUTANS L. Poaceæ. **Melic grass.**

Variety *pallens*.

A rather tall pale ornamental perennial grass native to Europe and northern Asia.

53151. MYOSOTIS ARVENSIS (L.) Hill. Boraginaceæ. **Forget-me-not.**

An annual or biennial erect plant 8 to 20 inches high, which bears blue or white flowers. Native to Europe and Asia.

For previous introduction, see S. P. I. No. 53059.

53152. MYOSOTIS STRICTA Link. Boraginaceæ. **Forget-me-not.**

A tender annual with small blue or whitish flowers. Native to Europe, the Orient, and northern Africa.

53153. NIGELLA DAMASCENA L. Ranunculaceæ. **Love-in-a-mist.**

A hardy southern European annual 1 to 2 feet high, bearing large white or blue flowers.

For previous introduction, see S. P. I. No. 53061.

53154. NONNEA ROSEA (Bieb.) Link. Boraginaceæ. **Rose alkanet.**

An attractive, hardy, procumbent annual native to northern Caucasus. The funnel-shaped flowers are white or purple.

For previous introduction, see S. P. I. No. 53062.

53155. POA ALPINA L. Poaceæ. **Spear-grass.**

A good pasture grass native to Kazan Province, northern Volga region, Russia.

For previous introduction, see S. P. I. No. 53064.

53156. POA CAESIA J. E. Smith. Poaceæ. **Spear-grass.**

A European perennial grass with rather rigid culms 1.5 to 6 decimeters high.

For previous introduction, see S. P. I. No. 53065.

53157. POA CHAIXII Vill. Poaceæ. **Spear-grass.**

A tall, relatively coarse species with rather broad blades and drooping panicles. Native to Europe and Asia Minor.

For previous introduction, see S. P. I. No. 53066.

53158. RANUNCULUS ACONITIFOLIUS L. Ranunculaceæ. **Crowfoot.**

Variety *platanifolius*.

A variety of the common white-flowered buttercup of Europe, with leaves like those of a plane tree.

53159. SESLERIA COERULEA Arduino. Poaceæ. **Moor-grass.**

A hardy, blue-gray perennial grass up to 1½ feet high, native to the British Isles.

53122 to 53175—Continued.

53160. STIPA PENNATA L. Poaceæ. **Feather grass.**

An ornamental grass with plumose panicles borne on culms 2 to 3 feet high which are in bunches. Native to the steppes of Europe and Siberia.

For previous introduction, see S. P. I. No. 53072.

53161. SYMPHYTUM ASPERRIMUM Donn. Boraginaceæ. **Comfrey.**

A coarse European perennial herb with short pricklelike hairs and purple flowers.

53162 to 53173. THALICTRUM spp. Ranunculaceæ. **Meadow rue.**

53162. THALICTRUM ANGUSTIFOLIUM L.

A hardy herbaceous perennial 3 feet high, with pale-yellow flowers, useful as a background for herbaceous borders. Native to Germany.

For previous introduction, see S. P. I. No. 49869.

53163. THALICTRUM AQUILEGIFOLIUM L.

The European "feathered columbine," 1 to 3 feet high, with large hollow stems, white flowers, and purple or white stamens.

53164. THALICTRUM DELAVAYI Franch.

A slender Chinese plant 2 to 3 feet high, with nodding purple flowers half an inch long.

53165. THALICTRUM FENDLERI Engelm.

A rather stout leafy plant native from southern Colorado westward and southward. The flowers are in compact panicles.

53166. THALICTRUM FLAVUM L.

Variety *heterophyllum*.

A European plant 2 to 4 feet high with leaves smaller than in *Thalictrum flavum* and slightly toothed and bearing compound, compact inflorescences of erect pale-yellow flowers.

53167. THALICTRUM FOETIDUM L.

A hardy herbaceous perennial less than a foot high, with white and yellow flowers. Native to France.

53168. THALICTRUM GLAUCUM Desf.

A glaucous southern European perennial herb 2 to 5 feet high, with erect panicles of yellow flowers.

53169. THALICTRUM KEMENSE Fries.

A plant with thin panicles of erect flowers and bipinnate leaves with round, 3-parted leaflets. Native to Europe, Asia, and northern Africa.

53170. THALICTRUM MINUS L.

A species 1 to 2 feet high native to Europe, Asia, and northern Africa, with loose panicles of drooping yellow or greenish flowers.

53171. THALICTRUM MINUS L.

Received as *Thalictrum dubium*, which is now referred to *T. minus*.

53172. THALICTRUM POLYGAMUM Muhl.

A branching species 3 to 8 feet high, with long leafy panicles of white flowers. Native to North America from Newfoundland and Canada to Florida and westward to Ohio.

53173. THALICTRUM SIMPLEX L.

A lilac or yellow-flowered species a foot high, native to Sweden.

53122 to 53175—Continued.

53174. TORRESIA ODORATA (L.) Hitchc. Poaceæ. **Holy grass.**

Holy grass, vanilla grass, or *Seneca grass,* native to Canada and the northern United States. It is sweet scented owing to the presence of coumarin. The Indians use the grass to make fragrant baskets.

Received as *Hierochloe odorata,* which is now referred to *Torresia odorata.*

53175. TROLLIUS EUROPAEUS L. Ranunculaceæ. **Globeflower.**

A hardy herbaceous perennial 15 inches high, with lemon-yellow globular flowers 1 to 2 inches in diameter. Native to wet upland meadows of northern Europe.

53176. DIOSPYROS CONZATTII Standl. Diospyraceæ. **Persimmon.**

From Cerro Espino, Oaxaca, Mexico. Seeds presented by P. C. Standley, United States National Museum. Received May 16, 1921.

"*Zapote negro montés,* collected at Cerro Espino, April, 1921, by Prof. C. Conzatti. The fruit is said to be better than that of *Diospyros ebenaster.*" (*Standley.*)

A tree of particular interest on account of the exquisite flavor of its edible fruit, 4 centimeters in diameter and 2 centimeters long. In quality it is comparable with the *chico-zapote* (*Achras zapota*). It is green skinned and much smaller than the common black sapote. Propagation of this magnificent tree is relatively simple on account of its vigor and the altitude at which it thrives, 1,000 meters above sea level. (Adapted from *Boletín de la Dirección de Estudios Biológicos, vol. 2, No. 3, p. 316.*)

53177 to 53217.

From Ecuador. Collected by Wilson Popenoe, Agricultural Explorer of the Department of Agriculture. Received April 6, 1921. Quoted notes by Mr. Popenoe.

53177. BERBERIS QUINDUENSIS H. B. K. Berberidaceæ. **Barberry.**

"(No. 585a. Hacienda La Esperanza, near El Angel, Province of Carchi, Ecuador. February 15, 1921.) Seeds of *Espino.* A very pretty species of Berberis, similar to one obtained in Cuzco Amarca. From the mountains of Carchi Province, at about 12,000 feet elevation. This is one of the handsomest wild barberries I have seen in Ecuador. It makes an arborescent shrub up to 10 or 12 feet high, and has large, glossy, stiff, dark-green leaves. The flowers, which are produced in racemes about 3 inches long, are orange-yellow and half an inch broad. They are followed by small clusters of oval, blue-black fruits. The species is worthy of a trial in the southern United States, where it may prove to be of value as an ornamental."

53178. ONOSERIS SALICIFOLIA H. B. K. Asteraceæ.

"(No. 582a. Conraqui, near Ibarra, Ecuador. February 10, 1921.) Seeds of a low-growing, delicate plant which is abundant on dry rocky slopes in northern Ecuador at altitudes of 6,000 to 9,000 feet. It rarely surpasses 8 inches in height; the lively pink, daisylike flowers, about 2 inches broad, are borne on slender stems rising a few inches above the foliage. It flowers profusely and is recommended for trial as a border plant in the United States. It can probably be cultivated as an annual, though here it is, I believe, at least a biennial and probably a perennial."

53179. CHUQUIRAGA INSIGNIS Humb. and Bonpl. Asteraceæ.

"(No. 587a. Hacienda La Rinconada, Province of Carchi, Ecuador. February 15, 1921.) Seeds of *Chuquiragua,* from the páramo at an altitude of about 12,000 feet in Carchi Province. This plant, abundant on the high páramos of Ecuador, is said to have been sacred to the Incas. It is an unusually handsome thing and seems to me worthy of cultivation in other countries as an ornamental. It is a slender, half-shrubby plant, stiffly erect in habit, and reaching to 6 feet in height.

53177 to 53217—Continued.

The stems are clothed with narrow, stiff, sessile leaves of glossy dark-green color and are surmounted by heads of brownish orange flowers. The plant is noted in Ecuador because of the fact that its leaves will burn when green. The flower heads retain their color even when dry. The species will probably prefer a moist, rather cool climate such as that of the Pacific Northwest."

53180. PASSIFLORA MALIFORMIS L. Passifloraceæ. **Granadilla.**

"(No. 583a. Ibarra. Ecuador. February 14, 1921.) Seeds of *Granadilla de hueso*, grown in the valley of the Rio Chota, in northern Ecuador, at an altitude of about 6,000 feet. This species is a vigorous climber with ovate-cordate, light-green leaves about 3 inches long. The flowers have a large, conspicuous, whitish green calyx, and the corona is white, marked with purplish blue. The fruits are round, rarely more than 2 inches in diameter, with a thin shell yellowish green on the surface and whitish within. Though not more than an eighth of an inch thick, this shell is so hard that it is broken with difficulty. Within it are numerous small black seeds, each surrounded by juicy pulp of pale, orange-yellow color, and acid, highly aromatic flavor, similar to that of *Passiflora edulis*. The fruit is eaten out of hand and is a good one, worthy of cultivation in California and Florida, if it proves to be suitable for those States."

For an illustration of this new passion fruit from Ecuador, see Plate I.

53181. TACSONIA QUITENSIS Benth. Passifloraceæ.

"(No. 600a. From mountains near El Angel, Province of Carchi, Ecuador.) Seeds of *tacso*. From an elevation of about 12,000 feet. This wild plant much resembles the cultivated *T. mollissima* in foliage, flower, and fruit. It grows abundantly in ravines and among brush at high altitudes in northern Ecuador. The fruits are not much used by the natives, though they seem nearly as good as those of the cultivated *tacso*."

53182 to 53185. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

53182. "(No. 573. Hacienda San Vicente, Province of Carchi, Ecuador. February 17, 1921). Budwood of avocado No. 47. *Tamayo*. The parent tree stands in one of the huertas of the hacienda about half a mile north of the house at an altitude of 6,100 feet. This variety, so far as can be judged by an examination of the parent tree, is either a very unusual Mexican or else a hybrid between the Mexican and West Indian races. The fruit is of good size (about 18 ounces in weight) and of convenient oval form. In appearance it is fairly attractive, being smooth, with the surface light green, washed or overspread with maroon purple at the stem end. The skin is not woody; it resembles both in thickness and texture that of such large-fruited Mexican varieties as *Puebla* and *Gottfried*. The flesh is cream colored, with a very few inconspicuous fiber markings. The quality is very good. The seed is small and tight in the cavity. The tree appears to bear fair, but not heavy, crops.

"Formal description: Parent tree about 35 feet high, the trunk 18 inches thick at the base, dividing about 8 feet above the ground, and giving off the first branches at 12 feet. Crown oval, slender, open. Foliage when crushed has a very faint aniselike odor scarcely detectable.

"The fruit is broadly oval to obovoid in form; weight about 18 ounces; length about 4 inches and greatest breadth about 3¼ inches; base slightly tapering, the stem inserted to one side; apex very slightly and obliquely flattened; surface smooth, light green with numerous whitish green dots, and overspread with maroon purple or dull purple around the stem; skin thin, like that of the largest fruited Mexican varieties, rather tender; flesh cream

53177 to 53217—Continued.

colored, tinged green in a narrow zone close to the skin, with a few fiber markings but no tough fibers, the flavor rich and pleasant; quality good; seed relatively small, obovoid in form, tight in the cavity, with both seed coats rather closely surrounding the rough cotyledons. Principal season at San Vicente probably January and February.

"Because of the absence of well-defined seasons in the Chota Valley, where this and the following varieties are grown, avocado trees do not limit themselves to one crop during the year, but flower and fruit more or less continuously. For this reason it is not possible to calculate even approximately the season at which the Chota avocados will ripen in California or in Florida. This matter will have to be determined by trial.

"This variety is one of the most promising of the set obtained in the Chota Valley and is strongly recommended for trial throughout the avocado-growing regions of California and in the northern part of the avocado zone of Florida. It will probably prove to be hardier than the West Indian varieties."

53183. "(No. 575. Hacienda San Vicente, Province of Carchi, Ecuador. February 17, 1921.) Budwood of avocado No. 49. *Egas.* The parent tree stands in one of the huertas at the Hacienda San Vicente, about half a mile north of the house. This is a Mexican avocado, of much the same general character as *Puebla,* but having a relatively smaller seed than the latter. The fruit is broadly obovoid, 8 to 12 ounces in weight, and glossy maroon purple when fully ripe. The skin is of average thickness for a large-fruited Mexican avocado, the flesh devoid of fiber and of good quality. The seed is tight in the cavity; in some specimens it is very small, in others, medium sized. The parent tree is a very old and large one and is said to be very productive.

"Formal description: Parent tree 60 to 70 feet high, with the trunk 6 feet thick at the base and giving off a number of large branches 6 feet above the ground. The crown is broadly oval, fairly dense, and the foliage when crushed has a faint aniselike odor.

"The fruit is obovoid to broadly obovoid; weight from 6 to 12 ounces; length, 3½ to 4 inches; greatest breadth, 2½ to 3 inches; base broad, with the stem inserted somewhat obliquely in a moderately deep cavity; apex flattened obliquely, though not conspicuously so; surface smooth, glossy, deep-maroon purple, with very small light-maroon dots; skin thin, not very tough; flesh cream colored, devoid of fiber and with only very faint fiber markings, the flavor rich and pleasant; quality good; seed small to medium sized, broadly ovoid to almost oval, tight in the cavity with both seed coats closely surrounding the nearly smooth cotyledons. Season, December to February at San Vicente, with a few fruits maturing at other times of the year because of the peculiar climatic conditions of the region.

"Not as promising as avocado No. 47, but worthy of trial in California and Florida."

53184. "(No. 576a. Hacienda San Vicente, Province of Carchi. February 17, 1921.) Budwood of avocado No. 50. *Chota.* The parent tree stands in one of the huertas of the Hacienda San Vicente, about half a mile north of the house. This is a fine large Mexican avocado of attractive and convenient form, having a small seed and flesh of rich, pleasant flavor. The form is broadly elliptic to nearly round, the color deep purple when the fruit is fully ripe, and the seed tight in the cavity. This may possibly be a hybrid between the Mexican and West Indian, but I can see no definite indication that such is the case.

"Formal description: Parent tree 50 to 60 feet high, the trunk 3 feet thick at the base, branched at 10 feet above the ground. The crown is round, fairly dense, and the aniselike odor of the crushed leaves is fairly pronounced.



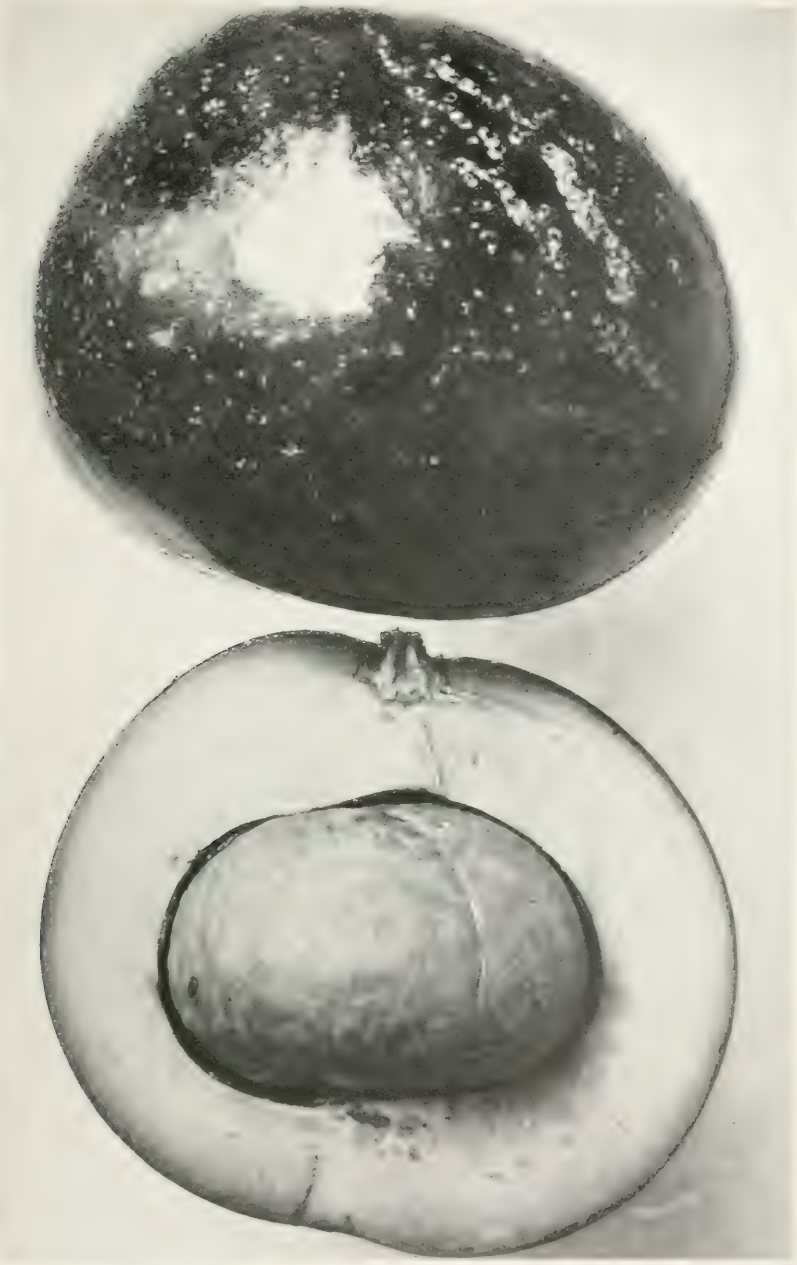
A HARD-SHELLED PASSION FRUIT FROM TROPICAL AMERICA. (PASSIFLORA MALIFORMIS L.; S. P. I. No. 53180.)

Several species of Passiflora are cultivated in the Tropics for their edible fruits as well as for the ornamental value of the plants themselves, which usually bear attractive flowers and are excellent for covering arbors and fences. One of the most interesting species is *Passiflora maliformis*, whose fruits are so hard-shelled that they must be broken with a club or some heavy instrument. The juicy flesh which surrounds the small black seeds is acid and highly aromatic. It is often used to prepare a refreshing drink. (Photographed by Wilson Popenoe, Ibarra, Ecuador, May 25, 1921; P18582FS.)



THE PARENT TREE OF THE CARCHI AVOCADO. (PERSEA AMERICANA MILL.; S. P. I. No. 53185.)

In the remote Andes of northern Ecuador lies a small region known as the Chota Valley. The Mexican avocado was introduced into this valley at an early day, and through selection and, probably, crossing with the lowland or West Indian race of avocados, many superior forms have been developed. These remained horticulturally unknown until 1921, when they were discovered by a representative of the United States Department of Agriculture and several of the best obtained for trial in the United States and other countries. As in other parts of tropical America there are few avocado orchards in Ecuador, most of the trees being found about the homes of the inhabitants or scattered among other fruit trees in small irregular plantings. (Photographed by Wilson Popenoe, San Vicente, Ecuador, February 18, 1921; P18414FS.)



THE CARCHI AVOCADO, A VARIETY OF THE MEXICAN RACE. (PERSEA AMERICANA MILL.; S. P. I. No. 53185.)

This avocado, which belongs to the Mexican race in spite of the fact that it was found in a remote valley of northern Ecuador, seems worthy of trial in the United States because of its relatively large size and its excellent quality. It may prove hardier than most varieties of the Guatemalan race and therefore valuable for those parts of California and Florida which are subject to heavy frosts. (Photographed by Wilson Popenoe, Ibarra, Ecuador, February 19, 1921; P18426FS.)



THE YUNGARA POTATO, ONE OF THE BEST VARIETIES OF THE ECUADORIAN HIGHLANDS. (SOLANUM TUBEROSUM L.; S. P. I. No. 53195.)

The Andean region, native home of the potato, contains many cultivated forms of interest and possible value to plant breeders. Some may prove useful in the development of early or late varieties; others may be found blight resistant; and still others are valuable for their excellent flavor and quality. Many have been introduced into the United States for trial. Yungara, a productive and late-maturing sort and one of the principal commercial varieties of Ecuador, where it is cultivated at altitudes between 10,000 and 12,000 feet, may be taken as an example of the best sorts which have been produced in the Andes. (Photographed, natural size, by Wilson Popenoe, Ambato, Ecuador, January, 1921; P18334FS.)

53177 to 53217—Continued.

"The fruit is broadly elliptic, oval, or nearly round; weight about 10 ounces; length about 3¾ inches, greatest breadth about 3½ inches; base rounded to bluntly pointed, with the stem inserted slightly to one side of the center; apex very slightly and obliquely flattened; surface smooth, somewhat glossy, dark purplish maroon to purple, with large, pale maroon-colored dots; skin of average thickness for a large-fruited Mexican avocado; flesh rich cream colored, with fiber markings and even a few tough fibers in some specimens, while others have none at all; flavor rich and pleasant; quality good; seed small, round-ovoid, tight in the seed cavity, with both seed coats surrounding closely the slightly rough cotyledons. Principal season of ripening at San Vincente from February to April.

"Numerous specimens of this variety were examined; some of them were of excellent quality, while others had objectionable fiber in them. The difference may have been due to variation in the stage of maturity. If the variety, when grown in the United States, produces fruits which, at the proper stage of ripeness, are quite free from fiber, it should prove to be a genuine acquisition. The flavor is rich and the flesh very abundant."

53185. "(No. 577. Hacienda San Vicente, Province of Carchi. February 17, 1921.) Budwood of avocado No. 51. *Carchi*. The parent tree is growing in one of the huertas of the Hacienda San Vicente, about half a mile north of the house. This variety, except for its color, might be called a Mexican Trapp. It has the form of the latter, and it also has a seed somewhat larger than the ideal; but if the size of the fruit increases when the variety is given the advantage of good culture in the United States, it may prove to be a valuable sort. The fruit is oblate, about 8 ounces in weight, purple when ripe, with yellow flesh of good flavor and quality. The seed is sometimes loose in the cavity.

"Formal description: Parent tree 30 feet high, the trunk 18 inches thick at the base and branching at 8 feet above the ground. The crown is round, dense, with the foliage of peculiar wrinkled appearance. The leaves when crushed have a pronounced aniselike odor.

"The fruit is oblate, sometimes oblique; weight about 8 ounces, length about 2¾ inches; base rounded to slightly flattened, the stem inserted obliquely; apex conspicuously and usually somewhat obliquely flattened; surface smooth, dull purple in the fully ripe fruit, with large dots of lighter purple; skin of about average thickness for a large-fruited Mexican avocado; flesh yellow, tinged with pale green close to the skin, nearly free from fiber markings, the flavor rich and pleasant; quality good; seed large, oblate, tight in the cavity, with both seed coats adhering closely to the nearly smooth cotyledons; occasionally the seed coats separate. Principal ripening season at San Vicente from January to March."

For an illustration of the parent tree of the Carchi avocado, see Plate II. Fruits of the Carchi avocado are shown in Plate III.

53186. RUBUS ROSEUS Poir. Rosaceæ. **Raspberry.**

"(No. 584a. Hacienda La Esperanza, near El Angel, Province of Carchi, Ecuador. February 15, 1921.) Seeds of *Mora de Rocota*. A rare berry from an altitude of 12,000 feet. It is nearly round, red, 1½ inches in diameter, and of good quality. The fruits are much like those of the Colombian berry (*Rubus macrocarpus*) in general appearance, but smaller and better in quality. This species seems to be the same as the *Huagra-mora*, from the slopes of the Volcano Tungurahua at an altitude of about 9,000 feet, and the *mora* which grows in the Cordillera de Zamora, in Loja Province. The plant is not a large grower. It forms clumps about 5 feet high, or sometimes scrambles over other plants, its canes reaching to about 8 feet in length. The

53177 to 53217—Continued.

leaves are trifoliolate, with glossy, oval to oblong-acute, serrate leaflets, often having a maroon tinge. The rosy purple flowers, about 1½ inches broad, are borne few in a cluster; they are followed by oval or conical fruits 1 to 1½ inches long, crimson in color, juicy, and of pleasant subacid flavor. The seeds are not objectionably large nor hard. The plant is not very productive. This raspberry is worthy of a careful trial in the southern and far western parts of the United States, where it seems likely to succeed. Its productiveness can probably be increased by systematic pruning."

53187. SOLANUM sp. Solanaceæ. Potato.

"(No. 586. Hacienda La Rinconada, Province of Carchi, Ecuador. February 15, 1921.) Tubers of a wild potato from the mountains of Carchi, at an altitude of 12,000 feet. It grows abundantly in certain places, preferring the protection of shrubby vegetation along ravines on the páramo. The plant resembles that of the cultivated potato; the tubers, however, are rarely more than an inch long by half an inch in thickness, and they are whitish brown in color, with white flesh. They are not used by the inhabitants of this region. The plants appear to be attacked by late-blight, as are cultivated potatoes in the same region."

53188 to 53197. SOLANUM TUBEROSUM L. Solanaceæ. Potato.

53188. "(No. 589. Hacienda La Rinconada, Province of Carchi, Ecuador. February 16, 1921.) Tubers of *Cumara* grown at altitudes of 11,000 to 12,000 feet. This is a good variety, of commercial importance only slightly less than that of the *Cuerudas*. The tubers are long, almost white in color, with purplish areas around the deep eyes."

53189. "(No. 590. Hacienda La Rinconada, Province of Carchi, Ecuador. February 16, 1921.) Tubers of *Morada* from the Province of Carchi, where it is cultivated at altitudes of 11,000 to 12,000 feet. This is a variety of good quality, but of little commercial importance. The tubers are rather small, round, and dark purple."

For previous introduction, see S. P. I. No. 35507.

53190. "(No. 591. Hacienda La Rinconada, Province of Carchi, Ecuador. February 16, 1921.) Tubers of *Cueruda morada* (purple Cueruda), from the Province of Carchi, where it is cultivated at altitudes of 11,000 and 12,000 feet. Commercially one of the best and most important varieties in northern Ecuador, though it is not quite so extensively grown as *Cueruda blanca*. The tubers are oval, flattened, and purple with whitish areas around the shallow eyes; they possess excellent keeping qualities."

53191. "(No. 592. Hacienda La Rinconada, Province of Carchi, Ecuador.) Tubers of *Margarita*, from the Province of Carchi, where it is cultivated at altitudes of 10,000 and 12,000 feet. This is an important commercial variety, especially in the vicinity of Ibarra; the plants are, however, very susceptible to late-blight. The tubers are oval, flattened to an unusual degree, and of good size. The surface is pale whitish brown, with fine purplish markings, and the eyes are scarcely noticeable. The flesh is white, of excellent quality."

53192. "(No. 594. Hacienda La Rinconada, Province of Carchi, Ecuador. February 16, 1921.) Tubers of the *Rosa* potato, cultivated in the Province of Carchi, at altitudes of 11,000 to 12,000 feet. This is not an important or well-known variety. The tubers are oval, slightly flattened, deep rose in color, with shallow eyes."

53193. "(No. 595. Hacienda La Rinconada, Province of Carchi, Ecuador. February 16, 1921.) Tubers of *Cueruda blanca* (white Cueruda), cultivated in the Province of Carchi, at altitudes of

53177 to 53217—Continued.

11,000 and 12,000 feet. This is the most important commercial potato of Carchi Province. At Ibarra, where it is one of the favorite varieties in the market, it is known as *Pastuza*. It yields heavily, and the whitish brown, somewhat flattened, oval tubers are of good size and quality. The eyes are very shallow and not numerous."

53194. "(No. 596. Hacienda La Rinconada, Province of Carchi, Ecuador. February 16, 1921.) Tubers of *Leche*, cultivated at altitudes of 11,000 to 12,000 feet. This is a good variety, of some commercial importance, especially in the vicinity of Ibarra. It yields heavily, and the round, whitish brown, rather large tubers are of good quality. They have, however, rather deep eyes."

53195. "(No. 597. Ibarra, Ecuador. February 12, 1921.) Tubers of *Yungara*, from the Hacienda La Rinconada, in the Province of Carchi, where it is cultivated at altitudes of 10,000 to 12,000 feet. This is probably the same as the Yungara of Ambato, but is not as important commercially in northern Ecuador as it is in the latter region. This productive and late-maturing variety yields oblong, medium-sized tubers, light rose colored with yellow areas around the few and not very deep eyes. The flesh is white and of good quality; the plant is not resistant to late-blight."

For an illustration of tubers of the Yungara potato, see Plate IV.

53196. "(No. 598. Ibarra, Ecuador. February 12, 1921.) *Pastuza*, from the Hacienda La Rinconada, in the Province of Carchi, where it is cultivated at altitudes of 11,000 and 12,000 feet; it is one of the favorite varieties in the market at Ibarra. This is probably the same variety as *Cueruda blanca* (white Cueruda). This is the most important commercial potato of Carchi Province. It yields heavily, and the whitish brown, somewhat flattened, oval tubers are of good size and quality. The eyes are very shallow and not numerous."

53197. "(No. 593. Hacienda La Rinconada, Province of Carchi, Ecuador. February 16, 1921.) *Amarga*, cultivated in the Province of Carchi, at altitudes of 11,000 and 12,000 feet. This is not an important or well-known variety. Its tubers are of irregular shape, rather small, pale rose in color, with deep eyes."

53198. JUGLANS sp. Juglandaceæ. **Walnut.**

"(No. 599a. Ibarra, Ecuador.) The *tocte* (black walnut) of northern Ecuador. Seeds obtained in the market of Ibarra. There are probably two species of Juglans in Ecuador which go under this name: one of them is *J. peruviana*, the other as yet undescribed. Both are found in the highlands, between altitudes of 6,000 and 10,000 feet; one or the other is abundant, in nearly every town of the Sierra. The tree is sometimes called *nogal*, as well as *tocte;* the fruit is always known by the latter name.

"Luis Cordero (Enumeración Botanica) says of this tree in the Province of Azuay: 'It is most useful, since it furnishes, aside from its grateful fruit and its fine, solid, and beautiful wood, a tonic of probable efficacy, obtained from boiling the leaves.' The plant is much used by the Indians of Imbabura Province in the preparation of dyes.

"The *tocte* is abundant at Ambato. It can scarcely be termed a cultivated species in this region, since it is not commonly planted; but trees which spring up around cultivated fields and in dooryards are allowed to grow unmolested, and the fruit is utilized in a small way. The plant strongly resembles *Juglans nigra*, but the foliage is perhaps larger. The nuts are an inch and a half in diameter, with a very thick, bony shell deeply corrugated on the surface and a kernel of mild, pleasant flavor. Recently the species has been utilized in Ambato as a stock plant on which to graft *Juglans regia*.

53177 to 53217—Continued.

"In Ibarra the *tocte* is very abundant, and the nuts are commonly sold in the market. They are used to prepare a famous sweetmeat, the 'nogada' of Ibarra, made from brown or white sugar, milk, and walnut meats. At Otavalo the tree is quite abundant, as also in the southern part of Ecuador at Loja and Cuenca. The two species which go under this name are very similar in character."

53199 to 53215. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

"(No. 580a. Ibarra, Ecuador. February 18, 1921.) *Torta.* A peculiar bean occasionally cultivated at Ibarra. The vine, which is slender, climbs over fences and low vegetation; the thin beans, resembling a Lima bean in size and outline, are curiously marked with various colors. They are not commonly eaten in this region, but are used by the children in playing various games. They may be of interest to our plant breeders because of the remarkable color combinations which they exhibit.

"They are not eaten here, though I am inclined to think they are edible."

53199. Black.

53200. Dark brown.

53201. Dark maroon flushed with black.

53202. Burgundy.

53203. Reddish brown with black flecks.

53204. Light tan.

53205. Blackish brown with a cream splotch.

53206. Black with stripes and splotches of yellowish green.

53207. Lemon yellow with black stripes.

53208. Cream with brown stripes.

53209. Cream with Burgundy stripes.

53210. Grayish white flushed with dark brown.

53211. Cream with black spots and black end.

53212. Cream with one end black.

53213. Cream with black ring around hilum.

53214. Lemon yellow with Burgundy spots and end.

53215. One half of surface dark brown; other half cream with brown spots.

53216. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

"(No. 588. Hacienda La Esperanza, near El Angel, Province of Carchi, Ecuador. February 14, 1921.) Tubers of *Papa chaucha.* An unusually early variety from an altitude of nearly 12,000 feet. The *chauchas* (Quichua, early) are a group of potatoes cultivated in the Ecuadorian highlands at altitudes of 8,000 to 12,000 feet. Commercially they are not very important, due to the fact that they do not keep as well as other varieties, but they are much cultivated for home use. The tubers are of good size; those of some varieties are of good quality, while others are rather inferior. The color of both surface and flesh is variable.

"The chauchas mature in about five months from the time of planting, when cultivated at an elevation of 12,000 feet; other varieties require seven to eight months. As soon as the plants come into bloom the tubers are considered to be mature and are dug for eating. Unlike other varieties, which must be dug and then stored for a period before they are resown, the chauchas can be resown immediately after digging. The yield is fairly heavy, but not as great as that of some of the late-maturing varieties.

53177 to 53217—Continued.

"Several varieties were mixed together in the lot sent under this number; none of them, however, is of the very best quality."

53217. ZEA MAYS L. Poaceæ. **Corn.**

"(No. 581a. Ibarra, Ecuador. February 19, 1921.) *Chulpi sara* (Quichua, wrinkled corn), from the market of Ibarra. A genuine sweet corn, the first I have found in tropical America. This is a native sweet corn, cultivated in the mountains of Ecuador at altitudes of about 7,000 to 9,000 feet. The ears are commonly 4 to 8 inches long, with the grains golden brown and wrinkled when dry. It is a variety not commonly seen in this region, but occasionally cultivated by the Indians. It may perhaps be useful in producing a variety of sweet corn for the warmer regions of the United States."

53218 and 53219. RUBUS spp. Rosaceæ.

From Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer of the Department of Agriculture. Received April 21, 1921. Quoted notes by Mr. Popenoe.

53218. RUBUS ROSEUS Poir. Rosaceæ. **Raspberry.**

"(No. 602a. Upper slopes of the Volcano Tungurahua. March 10, 1921.) *Huagra-mora.* A choice large-fruited wild red raspberry from an altitude of 9,000 feet. Since this is found at altitudes of 9,000 to 12,000 feet, it may prove hardier than many of the other species we have obtained in these countries. The fruits are much like those of the Colombian berry (*R. macrocarpus*) in general character, but small and better in quality. They are up to about an inch and a half in length, deep red, and of very good flavor."

For previous introduction, see S. P. I. No. 53186.

53219. RUBUS ADENOTRICHOS Schlecht. Rosaceæ. **Blackberry.**

"(No. 603a. Upper slopes of the Volcano Tungurahua. March 10, 1921.) *Pondoa.* A wild blackberry which is a better fruit than many of the other wild blackberries of Ecuador. This is the common *mora* of the settlement known as Pondoa, which lies upon the slopes of the Volcano Tungurahua at an altitude of 7,500 to 8,500 feet. This is a vigorous species of Rubus, sending up stiff canes to a height of 15 feet. It does not climb, as a rule, but the stems frequently bend over and are supported by near-by vegetation. The leaflets are five in number, or sometimes three when the leaves arise from small shoots. The canes are clothed with stiff wine-red hairs. The racemes are often a foot in length; the flowers are rather small and pinkish white. The fruits are produced abundantly; they are oval to nearly round, about three-fourths of an inch long, purplish black when fully ripe, each one composed of many small drupelets set closely together. The flavor is rich and agreeably subacid; the seeds are soft and not troublesome in the mouth. This may be considered an excellent blackberry and one which merits horticultural attention. It should be tested in the southern and western portions of the United States."

53220 to 53225. RIBES VULGARE Lam. Grossulariaceæ. **Garden currant.**

From Winchester, England. Plants purchased from Millier & Sons. Received April 25, 1921. Quoted notes by Millier & Sons.

53220. "*New Red Dutch.*"

53221. "*Raby Castle.*"

53222. "*Scotch Red.*"

53223. "*White Dutch.*"

53224. "*White Transparent.*"

53225. "*White Versailles.*"

53226 to 53231. RIBES VULGARE Lam. Grossulariaceæ. **Garden currant.**

From Middle Green, England. Plants purchased from J. C. Allgrove, Langley, near Slough. Received April 25, 1921. Quoted notes by Mr. Allgrove.

53226. "*Fay's Prolific.*" 53227. "*Raby Castle.*"

For previous introduction, see S. P. I. No. 53221.

53228. "*Red Dutch.*"

A red-fruited variety with folded or cupped leaves which are not markedly thick or coarse. (Adapted from *Proceedings of the American Society for Horticultural Science, 1917, p. 65.*)

53229. "*White Dutch.*"

A white-fruited variety with folded or cupped leaves which are not markedly thick or coarse. (Adapted from *Proceedings of the American Society for Horticultural Science, 1917, p. 65.*)

For previous introduction, see S. P. I. No. 53223.

53230. "*White Dutch,* cut leaved."

53231. "*White Versailles.*"

A white-fruited variety with flat leaves not markedly thick or coarse and lightly pubescent on the lower surface. (Adapted from *Proceedings of the American Society for Horticultural Science, 1917, p. 65.*)

For previous introduction, see S. P. I. No. 53225.

53232 to 53237. RIBES VULGARE Lam. Grossulariaceæ. **Garden currant.**

From Bourg la Reine, Seine, France. Plants purchased from Nomblot-Bruneau. Received April 27, 1921. Quoted notes by Nomblot-Bruneau.

53232. "*Cerise blanche.*"

53233. "*Cerise rouge.*"

53234. "*Hollande blanche.*"

For previous introduction, see S. P. I. No. 53229.

53235. "*Hollande rouge.*"

For previous introduction, see S. P. I. No. 53228.

53236. "*Versaillaise blanche.*"

For previous introduction, see S. P. I. No. 53231.

53237. "*Versaillaise rouge.*"

53238. CAJAN INDICUM Spreng. Fabaceæ. **Pigeon-pea.**

From Santiago de las Vegas, Cuba. Seeds presented by Dr. Mario Calvino, director, Estación Experimental Agronómica. Received April 29, 1921.

"*Cyandul.*" (*Calvino.*)

This named variety was introduced for experimental use in the Office of Forage-Crop Investigations.

53239. HORDEUM VULGARE PALLIDUM Seringe. Poaceæ. **Barley.**

From Bengazi, Libia, Africa. Seeds presented by the director of Economic and Financial Affairs, Servizi Agrari, Governo della Cirenaica. Received April 30, 1921. Quoted notes by the director.

"Barley grown in Cyrenaica under conditions of the greatest aridity."

53240 and 53241.

From Montevideo, Uruguay. Seeds presented by Sr. R. Salgueiro Silveira, Técnico del Laboratorio Agronómico. Received May 3, 1921. Quoted notes by Sr. Salgueiro.

53240. HELIANTHUS ANNUUS L. Asteraceæ. **Sunflower.**

"A plant cultivated here, of great importance for its seeds from which is extracted an edible oil, which is also useful in the paint industry. The red variety, which is 2 meters high, is used as props for tomatoes. Sheep and birds eat the seeds, and the stalks are burned and used as fertilizer."

53241. PHALARIS BULBOSA Jusl. Poaceæ. **Canary grass.**

"Seeds harvested in this country. The grass is of great food value."

A perennial tufted grass, with shiny leaves about two-fifths of an inch wide and roots penetrating the soil to a depth of nearly 3 feet; native to the Mediterranean countries. It is now cultivated in New South Wales, where it appears to be an excellent permanent winter grass for coastal and table-land districts. Owing to its deep roots it can endure a considerable amount of drought. Seeds are borne very sparsely on short stems thrown up from the center of the crown.

For previous introduction, see S. P. I. No. 44696.

53242. RICINUS COMMUNIS L. Euphorbiaceæ. **Castor-bean.**

From Montevideo, Uruguay. Seeds presented by Sr. R. Salgueiro Silveira, Técnico del Laboratorio Agronómico. Received April 25, 1921.

"Seeds, harvested in this country, of a castor-bean which I recommend." (*Salgueiro.*)

53243. PERSEA sp. Lauraceæ.

From Darjiling, India. Seeds secured by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received May 10, 1921.

"Bought March 4, 1921, in the Darjiling market from Tibetans, who are very fond of it. The fruits are green and the size of a small tennis ball, perfectly round; the flesh is like that of the avocado, both in color and taste. The fruit and seed are entirely different in shape from those of the avocado. These fruits come from an altitude of 7,000 feet and should therefore be quite resistant to light frosts, since there was plenty of snow at Darjiling this winter." (*Rock.*)

53244 to 53261.

From Quedlinburg, Germany. Seeds purchased from Carl Beck & Co. Received May 6, 1921.

Introduced for experimental work at the request of department specialists.

53244. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

Turkische Prunk oder Feuer.

53245 to 53261. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53245. *Don Carlos.*

53246. *Flageolet oder Pariser.*

53247. *Flageolet oder Pariser, weisse.*

53248. *Hinrichs Riesen.*

53249. *Hinrichs Riesen.*

53250. *Juli.*

53251. *Kaiser Wilhelm.*

53252. *Mont d'or.*

53253. *Phänomen.*

53254. *Schlachtschwert.*

53255. *Schlachtschwert.*

53256. *Schmalzgrosse.*

53257. *Wachs-Dattel.*

53258. *Wachs Flageolet.*

53259. *Zehwochen.*

53260. *Zucker-Butter-Brech.*

53261. [Unlabeled.]

53262. Ochroma lagopus Swartz. Bombacaceæ. **Balsa.**

From Camaguey, Cuba. Seeds presented by John R. Johnson, through Dr. R. L. Luaces, director, Granja Escuela. Received May 9, 1921.

"I believe that this tree will produce very well at Miami, for the flowers form during March." (*Luaces.*)

A West Indian tree 18 meters high with brown tomentose to nearly glabrous, obscurely 3 to 5 lobed leaves 15 to 20 centimeters long, and yellowish white flowers 10 centimeters long. The utilization of the wood of Ochroma has brought that genus into prominence during the last few years. The manufacture of buoyancy and insulation products, such as life rafts, refrigerators, and parts of lifeboats and airplanes, especially in connection with the war, has become very extensive. Eighty thousand floats made of balsa wood were used in constructing the 250-mile submarine mine barrage in the North Sea: war vessels as well as transports were in so far as possible equipped with balsa life rafts and lifeboats; and special refrigerating trucks with balsa as the insulating material were used in France. The wood of the trees of this genus is the most notable among light-weight woods. It is generally known in Spanish America as "balsa," and that word has been transferred to and is in general use in the United States. Balsa is the Spanish word for raft, and it was applied to this tree because the Spanish colonists, when they migrated to the New World, found it in use by the natives for rafts.

Balsa is a very common and conspicuous tree in tropical America. It is distinguished not only by its light soft wood, but also by its large simple leaves, large solitary flowers, and very conspicuous fruit, which is not unlike a cotton boll on a large scale. When the fruit is matured, but has not finally burst, it looks much like a rabbit's foot and presumably from this the first species of Ochroma to be described received the specific name "lagopus." When the fruit finally bursts and the mass of down falls to the earth, it suggests the fur of a rabbit. The seeds are enveloped in this fur and are disseminated by it. They resemble small grape seeds and, unlike cotton, the "down" is not firmly and permanently attached to the seed.

The species of this genus most frequently occur in the lowlands and foothills, though rarely, if ever, where the soil is at all affected by brackish or salt water. They have not been discovered in the higher altitudes, that is, at more than 1,000 meters above sea level.

Balsa is usually a second-growth tree, though it does occur as an isolated tree in the primeval forest. It appears promptly and abundantly where clearings have been made by natural agencies, such as floods and fires, or by human cultivations. In this respect it might properly be called a tree "weed." The natural seeding in some places produces such an abundance of young plants as to suggest weeds in a neglected garden. The tree's growth is very rapid. In the natural state the wood is very perishable. One rarely sees the remains of trees of balsa in the tropical forests. They decay with apparently the same rapidity as a cotton fabric; the wood absorbs moisture readily and shrinks and warps badly. This is due undoubtedly to the feeble lignification of the cell walls and to the lack of aseptic properties such as the timber of oak and pine possess. It was only when engineers, after protracted investigation and experiments, overcame these defects that the wood could be fabricated into valuable products. (Adapted from *Journal of the Washington Academy of Sciences, vol. 9, p. 157.*)

For previous introduction, see S. P. I. No. 47593.

53263 to 53266. Gossypium barbadense L. Malvaceæ. **Cotton.**

From Gizeh, Egypt. Seeds presented by T. Trought, botanist, Ministry of Agriculture. Received May 4, 1921. Quoted notes by Mr. Trought.

53263. "*Ashmouni*, second grade, selected."

For previous introduction, see S. P .I. No. 7030.

53264. "*Doumains Assili.*"

53265. "*Doumains Sakel.*"

53266. "*Zagora.*"

53267 to 53377.

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. Received April 18, 1921. Notes from Vilmorin-Andrieux & Co.

53267 and 53268. CUCUMIS SATIVUS L. Cucurbitaceæ. **Cucumber.**

53267. "*Cornichon fin de Meaux.* An early, very productive gherkin from Meaux, with small cylindrical fruits in great demand for pickling."

53268. "*Cornichon vert petit de Paris.* A small green gherkin from Paris, a very productive vigorous variety extensively cultivated. The fruits are ready for pickling about eight days from the time of the setting of the flowers and can be harvested continuously from July to October."

53269 to 53272. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

53269. "*D'Espagne blanc* (white Spanish), a very hardy, productive bean."

53270. "*D'Espagne rouge.*" **53272.** "*D'Espagne varié.*"

53271. "*D'Espagne bicolore.*"

53273 and 53274. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

53273. "*Du Cap marbré* (marble head). Seed spotted with red on a white ground."

53274. "*De Lima* (Lima). Short, very flat and large pods with large yellowish white seeds."

53275 to 53377. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53275. "*A rames extra-hâtif* (extra-early climber). An extremely early, very productive variety with long plump pods and white seeds."

53276. "*De Liancourt* (from Liancourt, Oise, France), with white, almost dull seeds. A hardy, vigorous, productive variety much esteemed for the dried seeds."

53277. "*Flageolet rouge à rames* (red climbing bean). An extremely productive variety with long, very delicate pods and excellent seeds."

53278. "*Nicard.* A white, flat-seeded variety suited to the South."

53279. "*Riz à rames* (climbing rice). A variety having a small white seed with very delicate skin which seems to melt in cooking."

53280. "*Rouge de Chartres* (red bean from Chartres). A variety extensively cultivated."

53281. "*Sabre à très grande cosse* (Sword variety with a very large pod). A vigorous variety yielding pods 25 to 30 centimeters long and most desirable because of its long season. The white seeds are excellent shelled fresh and the dry seed is also of excellent quality."

53282. "*De Sallandre amelioré* (improved Sallandre). A variety with very long pods well filled with fine large seeds. Highly esteemed for its productiveness."

53283. "*De Soissons blanc à rames, surchoix d'élite trié* (White Soissons Runner, choice selected variety). A variety with a very delicate flavor; one of the varieties most extensively cultivated for the dried seeds."

53284. "*De Soissons vert à rames* (Green Soissons Runner). A vigorous, productive variety with a strong stem reaching a height of about 3 meters and long pods containing ordinarily seven large, very green seeds of excellent quality."

53267 to 53377—Continued.

53285. "*D'Alger (beurre) noir à rames.*"
53286. "*Beurre blanc à rames.*"
53287. "*Beurre Couronne d'or.*"
53288. "*Beurre Roi des Mangetout à rames.*"
53289. "*Beurre du Mont-d'Or, à rames.*"
53290. "*Avant-gardé.*"
53291. "*Blanc geant sans parchemin.*"
53292. "*Blanc grand Mangetout.*"
53293. "*Mangetout du Maine.*"
53294. "*Mangetout de La Vallée.*"
53295. "*Mangetout de Saint-Fiacre.*"
53296. "*Mangetout de Saint-Fiacre blanc.*"
53297. "*Mangetout sans fil* (à rames)."
53298. "*Coco bicolore prolifique.*"
53299. "*Coco bicolore du Pape.*"
53300. "*Coco blanc.* H. gros Sophie."
53301. "*Coco rose à rames. H. de Prague marbre. H. boulot.*"
53302. "*Jaune d'or à rames.*"
53303. "*Phenomene à rames.*"
53304. "*Predome à rames.*"
53305. "*Princesse à rames. H. à la Reine.*"
53306. "*Quatre-à-quatre.*"
53307. "*Zebrè gris.*"
53308. "*De Bagnolet. H. petit gris. Suisse gris.*"
53309. "*Bagnolet vert.*"
53310. "*Bagnolet, à feuille d'Ortie.*"
53311. "*Barbes nain.*"
53312. "*Comtesse de Chambord. H. riz nain.*"
53313. "*Flageolet blanc extra.*"
53314. "*Flageolet blanc à longue cosse.*"
53315. "*Flageolet Chevrier, à grain toujours vert.*"
53316. "*Flageolet Merveille de France, à grain toujours vert.*"
53317. "*Flageolet Roi des verts.*"
53318. "*Flageolet nain Triomphe des chassis.*"
53319. "*Flageolet nain hâtif a feuille gaufrée. El à feuille d'Ortie.*"
53320. "*Flageolet très hâtif.*"
53321. "*Flageolet jaune ameliore H. prodige de Courtry. H. nain de Saint-Andre.* New variety."
53322. "*Flageolet noir.*"
53323. "*Flageolet rouge. H. dognon-de-coq.*"
53324. "*Flageolet beurre* (nain)."
53325. "*Flageolet rouge de Vitry.*"
53326. "*Empereur de Russie.*"
53327. "*Gloire de Lyon.*"
53328. "*Flageolet de Vitry blanc.*"
53329. "*Gros vert hâtif.*"

53267 to 53377—Continued.

53330. "*Incomparable. H. express.*"
53331. "*Incomparable à grain vert.*"
53332. "*Extra-précoce de Fontenay.*"
53333. "*L'Inepuisable.*"
53334. "*Du Perreux.*"
53335. "*Jaune cent-pour-un.*"
53336. "*Nain jaune extra-hâtif.*"
53337. "*Tres hâtif de Cholet.*"
53338. "*Noir de l'Hermitage.*"
53339. "*Prince noir.*"
53340. "*Nain Parisien. H. Souvenir de Deuil.*"
53341. "*Merveille de Paris. H. petit gris.*"
53342. "*Noir hâtif de Belgique.*"
53343. "*Du Bouscat.*"
53344. "*Le Bleu.*"
53345. "*Rond blanc commun.*"
53346. "*Metis. H. Eclipse.*"
53347. "*Rouge d'Orléans.*"
53348. "*Nain de Lignereux (Nouv.).*"
53349. "*Sabre nain. H. très hâtif de Hollande.*"
53350. "*Shah de Perse.*"
53351. "*De Soissons nain. H. gros pied.*"
53352. "*St-Esprit. H. à la religieuse. H. à l'aigle.*"
53353. "*Suisse blanc. H. lingot.*"
53354. "*Suisse nain blanc hâtif.*"
53355. "*Suisse rouge (1er choix).*"
53356. "*Très nain précoce (Nouv.).*"
53357. "*D'Alger (beurre) noir nain.*"
53358. "*Beurre noir nain à longue cosse.*"
53359. "*Beurre nain Gloire d'Ollainville.*"
53360. "*Beurre nain de tous les jours.*"
53361. "*Beurre nain Merveille du Marché.*"
53362. "*Beurre blanc nain.*"
53363. "*Beurre nain sans rival.*"
53364. "*Beurre doré nain.*"
53365. "*Beurre nain de Digoin.*"
53366. "*Beurre nain du Mont-d'Or.*"
53367. "*Coco marbre nain. H. de Prague marbre nain. H. boulot nain.*"
53368. "*Nain blanc hâtif sans parchemin.*"
53369. "*Nain blanc quarantain.*"
53370. "*Nain blanc Unique.*"
53371. "*Jaune de la Chine.*"
53372. "*Jaune du Canada.*"
53373. "*Nain Lyonnais à très longue cosse.*"
53374. "*Nain Lyonnais à grain blanc.*"

53267 to 53377—Continued.

53375. "*Nain Mangetout extra-hâtif.*"

53376. "*Prédome nain.*"

53377. "*Princesse nain à grosse cosse.*"

53378. Rubus sp. Rosaceæ.

From Honolulu, Hawaii. Plants presented by Willis T. Pope, horticulturist, Agricultural Experiment Station. Received April 27, 1921.

"A variety found growing on the slopes of Tantalus on this island (Oahu)." (*Pope.*)

53379. Rubus sp. Rosaceæ.

From Honolulu, Hawaii. Plants presented by Willis T. Pope, horticulturist, Agricultural Experiment Station. Received May 9, 1921.

"*Hitchcock berry.* Obtained from the locality of Glenwood on the island of Hawaii." (*Pope.*)

53380 to 53442.

From Bohemia, Czechoslovakia. Presented by Josef Mazanek. Received April 5, 1921.

53380. Malus pumila Mill. Malaceæ. **Paradise apple.**

"*Paradise.* A bushy apple growing usually about 5 feet in height. Native to the Caucasus, from which place it probably was introduced into western Europe, where it is now extensively used as a dwarfing stock for apples. This shrubby tree produces red apples of fair quality, is very drought resistant, and stands high summer temperatures. May be used in hybridization work and in creating a strain of bush apples." (*F. N. Meyer.*)

For previous introduction, see S. P. I. No. 42638.

53381 to 53401. Malus sylvestris Mill. Malaceæ. **Apple.**
(*Pyrus malus L.*)

53381. *Panenske ceske.*
53382. *Mazankovo malinove.*
53383. *Misen ceska.*
53384. *Reneta kminova.*
53385. *Strymka.*
53386. *Vejlimek.*
53387. *Zapovczene.*
53388. *Astrachan bily.*
53389. *Astrachan cerveny.*
53390. *Limburske.*
53391. *Malinove z Holovous.*
53392. *Charlamowski.*
53393. *Parmena zlata zimni.*
53394. *Tosonovicke.*
53395. *Reneta muskatova.*
53396. *Car Ales.*
53397. *Salove.*
53398. *Prazske pestre.*
53399. *Sirecek.*
53400. *Jablone.*
53401. *Doucin.*

53402 to 53414. Prunus domestica L. Amygdalaceæ. **Prune.**

53402. *Sliva domaci.*
53403. *Dolanka.*
53404. *Vlaska.*
53405. *Eslinska.*
53406. *Reineclaude zelena.*
53407. *Merunkova zluta.*
53408. *Merunkova cervena.*
53409. *Althanova.*
53410. *Spendlik.*
53411. *Mirabelka vancyska.*
53412. *Kirke.*
53413. *Mirabelka mala lutea.*
53414. *Sresky domaci.*

53380 to 53442—Continued.

53415. PRUNUS MAHALEB L. Amygdalaceæ. **Mahaleb cherry.**

Mahaleb cherry, for use as stock upon which to bud Japanese flowering cherries.

For previous introduction, see S. P. I. No. 18243.

53416 to 53426. PRUNUS spp. Amygdalaceæ. **Cherry.**

53416. PRUNUS sp. *Uherka cerna.*

53417. PRUNUS sp. *Msenska Janovka.*

53418. PRUNUS sp. *Lauremanova chrupka.*

53419. PRUNUS sp. *Obrovska z Hedelfingen.*

53420. PRUNUS sp. *Germerdorfska.*

53421. PRUNUS sp. *Mramorova.*

53422. PRUNUS sp. *Amarelka stinna.*

53423. PRUNUS sp. *Denisenova zluta.*

53424. PRUNUS sp. *Nejrannejsi.*

53425. PRUNUS sp. *Amarelka kralovska.*

53426. PRUNUS sp. *Oorovska vizen ze Sibenaku.*

53427. PRUNUS sp. Amygdalaceæ. **Plum.**

St. Julien.

53428 to 53441. PYRUS COMMUNIS L. Malaceæ. **Pear.**

53428. *Muskatelka letni.*

53429. *Prasilka.*

53430. *Dielova maslovka.*

53431. *Solanka.*

53432. *Avranska ceska.*

53433. *Pastornice.*

53434. *Boskova lahvice.*

53435. *Koperecka.*

53436. *Krivice.*

53437. *Malovanka.*

53438. *Jakubka ceska.*

53439. *Vejcita letno.*

53440. *Dzbernice.*

53441. *Hrusne.*

53442. PRUNUS sp. Amygdalaceæ. **Cherry.**

Tresne.

53443 and 53444. DIOSCOREA spp. Dioscoreaceæ.

From Antigua, British West Indies. Tubers presented by F. G. Harcourt, agricultural superintendent. Received May 9, 1921. Quoted notes by Mr. Harcourt.

53443. DIOSCOREA ESCULENTA (Lour.) Burkill. **Lesser yam.**

"*Spratt*, or *Antigua cush-cush.* A light-brown, thin-skinned, white-fleshed yam, producing numerous small tubers. When cooked, the flesh is floury, fine grained, and of excellent quality, the flavor somewhat resembling that of the English potato."

53444. DIOSCOREA TRIFIDA L. f. **Yampi.**

"*The Trinidad yampi*, or *cush-cush.* A dark-brown, thin-skinned yam of excellent quality, producing rather small globose tubers. When cooked, the flesh is fine grained, possesses a glistening appearance, and has also a rich but delicate flavor. (There appear to be three variations of color—white, pink, and purple fleshed.)"

53445. SOLANUM MAGLIA Schlecht. Solanaceæ.

From Lima, Peru. Tubers presented by the director, Ministerio de Fomento, Estación Central Agronómica. Received June 27, 1921.

A nearly glabrous wild potato, native to Chile, with angled, winged stems about 2 feet high; compound, light-green leaves 4 to 8 inches long; compound cymes of white flowers 1 inch wide; and subglobose or oblong tubers

up to 1½ inches long, with smooth, reddish brown surfaces. When boiled the tubers shrink and become watery and insipid. (Adapted from *Curtis's Botanical Magazine, pl. 6756.*)

For previous introduction, see S. P. I. No. 44185.

53446 to 53450.

From Wellington, New Zealand. Seeds presented by A. H. Cockayne. Received May 10, 1921. Quoted notes by Mr. Cockayne.

Introduced for experiments by Department specialists.

53446. LOTUS ULIGINOSUS Schkuhr. Fabaceæ.

Received as *Lotus major*, which is a form of *L. corniculatus*, but the sample does not agree with seeds of that species.

For previous introduction, see S. P. I. No. 48635.

53447. LOTUS sp. Fabaceæ.

Received as *Lotus hispidus*, but the sample does not agree with seeds of that species.

53448. MEDICAGO SATIVA L. Fabaceæ. **Alfalfa.**

"*Lucerne Marlboro.*"

53449 and 53450. TRIFOLIUM REPENS L. Fabaceæ. **White clover.**

53449. "*Hawkes Bay.*" **53450.** "*Canterbury.*"

53451. CUCUMIS SATIVUS L. Cucurbitaceæ. **Cucumber.**

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. Received April 18, 1921.

"*Cornichon de Toulouse* (gherkin from Toulouse)." (*Vilmorin-Andrieux & Co.*)

53452 and 53453.

From Allahabad, United Provinces, India. Seeds presented by William Bembower. Received April 14, 1921. Quoted notes by Mr. Bembower.

53452. ILEX sp. Aquifoliaceæ.

"Seeds of a black fruit that grew on a bush with hollylike leaves, collected in the hills of the Dehra Dun District, United Provinces, India."

53453. MYRICA RUBRA Sieb. and Zucc. Myricaceæ.

"*Kaiphal*, from the Dehra Dun District, United Provinces, India."

53454 to 53462. COFFEA spp. Rubiaceæ. **Coffee.**

From Tananarive, Madagascar. Seeds presented by J. G. Cairn, American consul. Received May 14, 1921. Quoted notes by Mr. Cairn.

"Varieties of Coffea cultivated on the east coast of Madagascar."

53454 and 53455. COFFEA CANEPHORA Pierre.

53454. This coffee thrives from sea level to an altitude of 1,000 meters and succeeds best at a height of 450 to 700 meters in a damp climate with abundant rain, the annual precipitation being 2,500 to 3,500 millimeters with a minimum of 2,000 millimeters and no long dry periods. Under favorable conditions a drought of two to three months' duration will do no harm, but if the drought extends beyond this the year's crop is seriously injured, though the trees do not appear to suffer permanently. The trees come into bearing at the age of 3 years and yield 875 to 1,300 kilograms per hectare under moderately favorable conditions and 1,700 to 2,300 kilograms on virgin soil and under favorable conditions. (Adapted from *Philippine Agricultural Review, vol. 9, p. 123.*)

53455. Variety "*Robusta.*" Apparently a robust form of *C. canephora.*

53454 to 53462—Continued.

53456. COFFEA CONGENSIS Froehn.

A tree with fuscous gray slender branches and glabrous subcoriaceous leaves, narrowly oval or elliptic; the fruits are oval. (Adapted from *Notizblatt des Königliches Botanischen Gartens und Museums zu Berlin, vol. 1, p. 235.*)

53457. COFFEA DEWEVREI Wildem. and Dur.

This species requires no shade and some plants yield 16 kilograms of berries in four months. From plants 34 to 38 months old, 8.3 kilograms of fresh berries make 1 kilogram of coffee. (Adapted from *Bulletin Agricole du Congo Belge, vol. 7, p. 293.*)

For previous introduction, see S. P. I. No. 50631.

53458. COFFEA EXCELSA Cheval.

A coffee which thrives from sea level to 700 meters, succeeds well on rather stiff clayey soils, and is quite drought resistant; it might be grown with an annual rainfall of 1,200 millimeters. It is the most resistant to drought and blight of any coffee, is of strong vigorous growth, and produces 1 kilogram of coffee from 7 to 8 kilograms of berries. *Excelsa* makes an excellent stock for other coffees. The first crop is obtained at the age of 4 to 5 years and a full crop at the age of 7 to 8 years. (Adapted from *Philippine Agricultural Review, vol. 9, p. 121.*)

For previous introduction, see S. P. I. No. 50632.

53459. COFFEA CANEPHORA KOUILOUENSIS Pierre.

A variety which yields 1 kilogram of coffee from 3.8 kilograms of berries. The small leaves make very dense shade and prevent the circulation of air, two causes which contribute to the development of the coffee blight, *Hemileia vastatrix*. (Adapted from *Bulletin Agricole du Congo Belge, vol. 7, p. 296.*)

53460. COFFEA LIBERICA Bull.

Among the Liberica types, *Coffea liberica* is the only one that has attained commercial importance. When first imported to Java this coffee was resistant to the blight and it was extensively planted; during recent years, however, a strain of the Hemileia has developed which so severely injures the Liberica that its cultivation has practically been abandoned. The yield averages 600 to 700 kilograms of coffee per hectare.

To produce 1 kilogram of marketable coffee, 10 kilograms of berries are required. The Liberica coffee has a large, hard berry which requires a special pulper. The Liberica coffee and all other closely allied varieties or species prefer low altitudes, from sea level to an altitude of 350 meters. All the coffees of this type succeed well even on rather stiff clayey soils and are quite drought resistant. (Adapted from *Philippine Agricultural Review, vol. 9, p. 121.*)

For previous introduction, see S. P. I. No. 51482.

53461 and 53462. COFFEA LAURENTII Wildem.
(*C. robusta* Hort.)

This variety was discovered in 1898 in the Kongo by Emile Laurent. One of the chief features of this new variety seems to be its immunity against disease. The plant grows very rapidly, and after eight months shows its first flowers. A small harvest is obtained in the second year, and the maximum production is reached in the fourth or fifth year. Clusters are numerous and contain 50 to 60 berries, which require 10 months to ripen. To make 1 kilogram of marketable coffee, 9 kilograms of the red berries are required.

The following are the yields per hectare of two plantations of *C. robusta* in Java, one of exhausted and one of virgin soil: Exhausted soil, second year, very little; third year, 485 kilograms; fourth year, 696 kilograms; fifth year, 1,066 kilograms. Virgin soil, second year, little; third year, 556 kilograms; fourth year, 1,657 kilograms. Trees properly

53454 to 53462—Continued.

cultivated have not shown the slightest falling off in yield at 12 years of age. (Adapted from *Daily Consular and Trade Reports, November 3, 1913.*)

53461. "*Robusta du Congo.*" 53462. "*Robusta du Java.*"

53463 and 53464. Solanum tuberosum L. Solanaceæ.

Potato.

From La Paz, Bolivia. Tubers presented by W. Duval Brown, American consul. Received May 3, 1921. Quoted notes by Mr. Brown.

53463. "*Purple-marked variety.* Grown in Bolivia at a high altitude and supposed to be very resistant to frost."

53464. "*White variety.* Grown in Bolivia at a high altitude and supposed to be very resistant to frost."

53465 to 53467.

From Avondale, Auckland, New Zealand. Seeds presented by H. R. Wright. Received May 14, 1921. Quoted notes by Mr. Wright.

53465. Alopecurus pratensis L. Poaceæ. **Foxtail grass.**

"New Zealand-grown grass from clayey hill country."

For previous introduction, see S. P. I. No. 34282.

53466 and 53467. Phleum pratense L. Poaceæ. **Timothy.**

53466. "New Zealand-grown timothy from drained peat swamp."

53467. "New Zealand-grown timothy from light pumice soil."

53468 and 53469. Cotoneaster spp. Malaceæ.

From Calcutta, Bengal, India. Seeds collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received May 9, 1921.

53468. Cotoneaster affinis Lindl.

"Collected at an altitude of 7,000 feet in the Himalayas near Darjiling, India, March 4, 1921." (*Rock.*)

A large deciduous Himalayan shrub or small tree with leaves pubescent beneath and compound, spreading, many-flowered cymes. The numerous slender-stalked, brown, roundish fruits are in large spreading bunches. The white strong elastic wood is used for walking sticks in the northwest Himalayas. The shrub is hardy in England. (Adapted from *Brandis, Forest Flora of India, p. 208.*)

For previous introduction, see S. P. I. No. 40173.

53469. Cotoneaster simonsi Baker.

"Collected at an altitude of 7,000 feet in the Himalayas near Darjiling, India, March 4, 1921." (*Rock.*)

For previous introduction, see S. P. I. No. 51493.

53470 and 53471.

From Calcutta, India. Seeds collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received May 9, 1921. Quoted notes by Mr. Rock.

53470. Terminalia myriocarpa Heurck and Muell. Arg. Combretaceæ.

"A tall, important, and very valuable timber tree of northeast Assam, where it is a protected tree in the Dibrugarh forests. It reaches a height of 80 to 100 feet, is deciduous, and fruits in January and February when the tree is bare. The tree grows in the more open forest land at an altitude of about 500 feet. Seeds collected from a tree found between Rangagora and Berjan forests February 21, 1921."

For previous introduction, see S. P. I. No. 47855.

53470 and 53471—Continued.

53471. TRACHYCARPUS MARTIANUS (Wall.) Wendl. Phœnicaceæ. **Palm.**

"A small-leaved fan palm from the Himalayas. These seeds came from specimens 40 feet in height, growing at an altitude of 7,200 feet near Darjiling. Collected March 3, 1921."

For previous introduction, see S. P. I. No. 50373.

53472 and 53473. HYDNOCARPUS spp. Flacourtiaceæ.

From Calcutta, Bengal, India. Seeds presented by Lieut. Col. A. T. Gage, director, Botanical Survey of India. Received May 27, 1921.

"From Tavoy, Burma, not previously represented in the museum collection. The seeds of both of these have a partially muricated testa which resembles that of *Hydnocarpus anthelminthica*." (*C. C. Calder.*)

53472. HYDNOCARPUS sp. Museum No. 37357.

53473. HYDNOCARPUS sp. Museum No. 37479.

53474. KHAYA NYASICA Stapf. Meliaceæ. **African mahogany.**

From Mount Silinda, Southern Rhodesia. Seeds presented by Dr. W. L. Thompson. Received May 27, 1921.

"One of our largest and most valuable timber trees." (*Thompson.*)

"A huge tree attaining a height of 150 feet or more and sometimes a diameter of 15 feet, one that I measured in the Inyamkuwha forest patch having attained this diameter at 8 feet from the ground just above the buttresses. Diameters of 5 to 8 feet are not uncommon. The trunk is almost invariably very straight and runs up to a considerable height before branching; the young saplings have much the appearance of young *Castilla elastica*. The bark is light gray, thick, smooth, or laminated, astringent in taste, and reminds one of quinine, hence the native name *umbaba* (to be bitter). The hard red timber has a handsome grain, easily worked, and weathers well above ground; it is untouched by Bostrychidæ or termites. The tree makes an enormous crown of handsome glossy foliage. The old trees are in full bloom at the commencement of November, and the fruits commence to ripen at the end of the following September, continuing to fall till December and littering the ground for some distance in every direction." (*E. G. Baker, Journal of the Linnean Society, vol. 40, p. 42.*)

53475. DIOSCOREA ALATA L. Dioscoreaceæ. **Greater yam.**

From Sebring, Fla. Tubers presented by J. B. Brown. Received June 1, 1921.

"The 63-pound yam was grown in one season; this particular one was planted near where the waste water was thrown and it got a fairly large quantity of water. I generally let them grow as long as they will. When we have no frost to kill the vines they will grow until March or April, and I then plant them a few weeks after they are dug, so that the growing season of the yam in question was about 11 months. Of course we have a dry season, and unless they are watered they do not thrive so well." (*Brown.*)

"A white-fleshed yam of very good quality from Panama. The underground tubers when of large size are irregular in shape. The vine produces tubers in the axils of the leaves, which are used for propagation." (*R. A. Young.*)

53476 and 53477. ERAGROSTIS ABYSSINICA (Jacq.) Schrad. Poaceæ. **Teff.**

From Paris, France. Seeds presented by Vilmorin-Andrieux & Co. Received June 1, 1921. Quoted notes by Vilmorin-Andrieux & Co.

A wonderful hay crop of the high veldt in the Transvaal and cultivated as a food grain in Abyssinia.

53476. "Seed of the reddish or brownish type."

53477. "White seed mixed with about 15 per cent of reddish type."

For previous introduction, see S. P. I. No. 48815.

53478 to 53482.

From Mauna Kea, Hawai'i. Seeds collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received June 1, 1921. Quoted notes by Mr. Rock.

53478 and 53479. STYPHELIA GRAYANA Rock. Epacridaceæ.

"An exceedingly handsome shrub closely allied to the heath family. It is loaded nearly all the year with white, pink, or red berries, making an exceptionally showy appearance. The shrub grows at altitudes of 10,000 to 11,000 feet on the slopes of Mauna Kea, Mauna Loa, and Haleakala, Hawaiian Islands. Worthy of cultivation as an ornamental garden plant. Collected on Mauna Kea, Hawaii, at an altitude of 10,000 feet, in May, 1921."

53480 to 53482. RUBUS MACRAEI A. Gray. Rosaceæ. Akala.

"The Hawaiian giant raspberry, occurring at an altitude of about 6,000 feet. It is a straight bush with the older branches thornless. The fruits, borne at the drooping tips of the branches, are very numerous, over 2 inches in diameter, and exceedingly juicy; the seeds are comparatively small. The flesh is slightly bittter, but otherwise delicious. This berry is of great promise, as it grows in a region where frost is not uncommon in the winter months. It would grow well in the Sequoia regions of the Pacific coast. Collected in May, 1921, on Mauna Kea, Hawaii."

53480. "Red variety, from Mauna Kea, Keanakolu."

53481. "Selected red variety from Mauna Kea, Hawaii."

53482. "Yellow, selected variety, from Mauna Kea, Hawaii. The variety with orange-yellow fruits is sparny, but the fruits are even larger than those of the red variety and sweet instead of bitter."

53483. FAGRAEA AURICULATA Jack. Loganiaceæ.

From Singapore, Straits Settlements. Seeds collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received June 1, 1921.

"A medium-sized tree with drooping branches and large, handsome, fleshy leaves. The snow-white, bell-shaped flowers measure 6 to 7 inches across and 5 to 6 inches long. It is exceedingly handsome and certainly worthy of cultivation; it is, however, distinctly tropical, being native to the Malay Peninsula. Collected at Singapore in March, 1921." (*Rock.*)

53484. STERCULIA MACROPHYLLA Vent. Sterculiaceæ.

From Calcutta, India. Seeds collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received June 1, 1921.

"A large tree with cordate suborbicular entire leaves which measure 10 to 12 inches long. It is native to the Malay Peninsula, but occurs also in Java." (*Rock.*)

For previous introduction, see S. P. I. No. 34366.

53485. OSTEOMELES OBTUSIFOLIA (Pers.) Kunth. Maleæ.

From Loja, Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer of the Department of Agriculture. Received June 8, 1921.

"(No. 609a. May 7, 1921. Loja, Ecuador.) *Quiqui*, collected near the town of Loja, in southern Ecuador. It is common in this region, along the edges of ravines and among scrub at altitudes of 7,000 to 8,000 feet. The plant is an arborescent shrub reaching to 12 or 15 feet. It is armed with long sharp thorns and has oblong-elliptic, blunt or acute, dentate leaves about an inch long. The thin-skinned fruits, which are produced in small terminal clusters, are round to oblate, deep red, and up to half an inch in diameter. A small quantity of yellowish, mealy flesh surrounds several hard seeds. The

flavor of the fruit is subacid and slightly acrid, resembling that of some of the northern haws (Crataegus).

"This plant has been used at Loja as a stock on which to graft the apple, according to Dr. Ramon Eguiguren. It is introduced for trial as a stock plant in the United States." (*Popenoe.*)

53486. DIGITARIA EXILIS (Kippist) Stapf. Poaceæ. **Fundi.**

From Kaduna, Nigeria, Africa. Seeds purchased from P. H. Lamb, Director of Agriculture, northern Provinces. Received March 28, 1921.

"This grass in a single season's testing has proved remarkably promising as forage for our Southern States. In the northern Provinces of Nigeria it seems to be known under the name of *acha*." (*C. V. Piper.*)

53487. ACROCOMIA SCLEROCARPA Mart. Phœnicaceæ. **Macauba palm.**

From Horqueta, Paraguay. Seeds procured by Thomas R. Gwynn. Received May 4, 1921.

"*Mbocaya* (coco). The *coco*, from the roots up, is a most valuable plant. When very young the roots can be used as mandioca. When matured, the stem, from a foot or two above the roots toward the bud of the plant, makes excellent starch, which is just as good as that furnished by the mandioca plant; moreover, this part of the plant yields nourishing feed, without any preparation, for all kinds of livestock and fowls. The leaves make thread and twine from which the Indians make hammocks that for endurance are par excellence. The *coco* has a long, straight body, sometimes 80 feet in height, and from its top sends out its long, feathery, waving leaves. The fruits are formed at the base of the leaves like huge bunches of grapes. From two to four bunches are produced every year by a single tree. The oil from the kernel is better than any olive oil to be found in this country, and the soap made from it is equal to any toilet soap in use. The one drawback to this palm is the thorns on the stems of the leaves and on the trunk. Sometimes, however, the trunk is entirely free from thorns, especially when very tall and in its full vigor. The leaves also furnish feed for stock; in times of drought when pasture fails the natives fell the trees for their horses and cattle and split open the trunks so that the cattle may eat the pith." (*Gwynn.*)

For previous introduction, see S. P. I. No. 51742.

53488. VACCINIUM MEYENIANUM Klotzsch. Vacciniaceæ.

From Hawaii. Seeds collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received June 11, 1921.

"Collected on Isoorora Hill, Northwestern District, British Guiana, in May, shrub 15 feet in height, native to the mountains of Hawaii, related to the ohelo berry (*Vaccinium reticulatum* Smith), and loaded with bright, cherrylike berries which are brilliant red for several months in the year. It grows at an altitude of about 4,000 to 5,000 feet and is especially abundant about the region of the Volcano Kilauea. The berry is less well known than the ohelo berry. Owing to the bright-red color of the berries they have been avoided for fear of their being poisonous. They are much juicier than the ohelo berries, but are often slightly bitter. Some, however, are sweet and delicious. The plant is peculiar to the Hawaiian Islands." (*Rock.*)

53489. CLUSIA sp. Clusiaceæ.

From Georgetown, Demerara, British Guiana. Seeds presented by R. Ward, superintendent, Botanic Gardens. Received June 9, 1921.

"Collected on Isoorora Hill, Northwestern District, British Guiana, in May, 1921." (*Ward.*)

The Clusias are opposite-leaved trees or shrubs, usually with roseate flowers, native to tropical America. They may be of value as ornamentals.

53490. OCHROMA LAGOPUS Swartz. Bombacaceæ. **Balsa.**

From Camaguey, Cuba. Seeds presented by Dr. R. L. Luaces, director, Granja Escuela. Received June 1, 1921.

"This tree grows rapidly, requiring only three years from seed to flower at this place, and makes a pretty shade tree. I believe that it will grow well in California and around Miami and Key West." (*Luaces.*)

For previous introduction see S. P. I. No. 53262.

53491 and 53492.

From Soledad, Cienfuegos, Cuba. Seeds presented by R. M. Grey, superintendent, Cuban Gardens. Received June 4, 1921.

53491. CASIMIROA EDULIS La Llave. Rutaceæ. **White sapote.**

A large tree with palmately compound leaves and small greenish yellow flowers. The delicious greenish yellow fruit, about the size of an orange, usually contains five large seeds. This fruit makes an excellent ice cream resembling that made from peaches. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 680.*)

For previous introduction, see S. P. I. No. 46661.

53492. GOSSYPIUM sp. Malvaceæ. **Cotton.**

"Brown cotton." (*Grey.*)

53493. GOSSYPIUM BARBADENSE L. Malvaceæ. **Cotton.**

From Alexandria, Egypt. Seeds presented by A. N. Anagnosti, agent for E. A. Shaw & Co., New York City. Received May 16, 1921.

Suprema cotton.

53494. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From Baguio, Benguet, Philippine Islands. Tubers presented by J. A. Wright, superintendent, Trinidad Agricultural School, through P. J. Wester, agricultural adviser, Bureau of Agriculture, Manila. Received June 14, 1921.

"These potatoes were grown near the mountain capital, one of the few places in the Philippines where potatoes are grown successfully." (*Wester.*)

53495. DIOSCOREA TRIFIDA L. f. Dioscoreaceæ. **Yampi.**

From Kingston, Jamaica. Tubers presented by W. S. Goodman, acting superintendent, Hope Gardens. Received June 21, 1921.

"*Jamaica yampi.* A white-fleshed medium-sized yam of excellent quality, said to be the most popular variety in Jamaica." (*R. A. Young.*)

53496. CASIMIROA sp. Rutaceæ. **White sapote.**

From Orange, Calif. Budwood presented by C. P. Taft. Received June 21, 1921.

"Seedless sapote." (*Taft.*)

53497 to 53499. COCOS NUCIFERA L. Phœnicaceæ. **Coconut.**

From Port Dickson, Negri Sembilan, Federated Malay States. Presented by Will P. Handover. Received June 11, 1921. Quoted notes by Mr. Handover.

53497. "*Green (Nyiur Puyah).*"

53498. "*Red (Nyiur Rajah).*"

53499. "*Yellow (Nyiour Gading).*"

53500 to 53527. PHASEOLUS spp. Fabaceæ. Bean.

From Reading, England. Seeds purchased from Sutton & Sons. Received April 4, 1921.

Introduced for experiments in breeding disease-resistant strains.

53500 to 53511. PHASEOLUS COCCINEUS L. Scarlet Runner bean.

53500. *Champion Scarlet.*
53501. *Chelsea Giant White.*
53502. *Ne Plus Ultra.*
53503. *Scarlet.*
53504. *Sutton's A–1.*
53505. *Sutton's Best of All.*
53506. *Sutton's Mammoth White.*
53507. *Sutton's Painted Lady.*
53508. *Sutton's Prize Winner.*
53509. *Sutton's Scarlet.*
53510. *Veitch's Hackwood Park.*
53511. *Veitch's Mammoth Scarlet.*

53512 to 53527. PHASEOLUS VULGARIS L. Common bean.

53512. *Canadian Wonder.*
53513. *Long-Podded Negro.*
53514. *Sutton's Canadian Wonder.*
53515. *Sutton's Everbearing.*
53516. *Sutton's Evergreen.*
53517. *Sutton's Forcing.*
53518. *Sutton's Green Gem.*
53519. *Sutton's Magnum Bonum.*
53520. *Sutton's Monster Negro.*
53521. *Sutton's Perfection.*
53522. *Sutton's Plentiful.*
53523. *Sutton's Prolific Negro.*
53524. *Sutton's Reliance.*
53525. *Sutton's Satisfaction.*
53526. *Sutton's Superlative.*
53527. *Sutton's White Haricot.*

53528 to 53531. SACCHARUM OFFICINARUM L. Poaceæ. Sugar cane.

From Saint Croix, Virgin Islands. Cuttings presented by Dr. Longfield Smith, agronomist in charge, Agricultural Experiment Station. Received May 9, 1921.

53528. *S. C. 12/4.*

A cane which has shown the most promise in a test of 120 varieties (imported and Saint Croix seedlings which had given promise in previous trials). It has given a larger yield in weight than other good canes previously grown. The canes yield quite as much juice as the standard cane, *Ribbon,* and the juice is generally distinctly richer in sucrose. The canes are fairly stout, an average specimen having a circumference of 5 to 6 inches. The internodes are 5 to 7 inches long. An exceptionally good specimen in a rotation field had 33 joints and gave the following measurements: Weight of cane, 21 pounds; length, 12 feet; circumference, 6.25 inches. (Adapted from *Louisiana Planter and Sugar Manufacturer, vol. 66, p. 308.*)

53529. *S. C. 12/37.*

A cane which gives good results as a plant and also as a ratoon. It yielded 5.9 tons per acre, showing an increase of 2.1 tons per acre over the *Ribbon* control plats. The ratoons gave 22.1 tons per acre. (Adapted from *Report of the Agricultural Experiment Station in St. Croix, 1914–15, p. 18.*)

53530. *S. C. 13/13.*

This cane gave 6.2 tons per acre, showing an increase of 2.9 tons over *Ribbon* cane. The ratoons gave 13.2 tons per acre. (Adapted from the *Report of the Agricultural Experiment Station in St. Croix, 1914–15, p. 20.*)

53531. [No label.]

53532. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

From Dos Cabezos, Ariz. Seeds presented by E. J. Hands. Received May 9, 1921.

"Beans that I got on a recent trip into Chihuahua, Mexico. The natives who live in the foothills grow these beans without irrigation and, in fact, grow no other beans. These may develop into something better than the common 'frijol.'" (*Hands.*)

53533. DOLICHOS LABLAB L. Fabaceæ. **Bonavist bean.**

From Yeungkong, Kwangtung, China. Seeds presented by Mrs. W. H. Dobson, Forman Memorial Hospital. Received May 9, 1921.

"The beans are said to be of long life, growing at all seasons in South China." (*Mrs. Dobson.*)

For previous introduction, see S. P. I. No. 50760.

53534. BROSIMUM ALICASTRUM Swartz. Moraceæ. **Breadnut tree.**

From Saint Jean le Blanc, Loiret, France. Seeds presented by E. Versin. Received May 12, 1921.

"The leaves are used extensively for forage purposes in Yucatan. The seeds are produced in great abundance and might be utilized as a source of industrial starch or perhaps distilled into alcohol." (*O. F. Cook.*)

For previous introduction, see S. P. I. No. 47996.

53535 to 53540. RUBUS spp. Rosaceæ. **Bramble.**

From Kew, England. Seeds presented by Sir David Prain, director, Royal Botanic Garden. Received May 14, 1921.

53535. RUBUS BIFLORUS QUINQUEFLORUS Focke.

This very ornamental variety, native to western Szechwan at altitudes of 5,800 to 6,800 feet, produces its clustered orange-yellow berries over so long a period as to be almost perpetual fruiting. Because of its wax-coated stems it is one of the most striking plants in the garden in autumn and winter. (Adapted from *Gardeners' Chronicle, vol. 46, p. 212.*)

For previous introduction, see S. P. I. No. 50294.

53536. RUBUS CHROOSEPALUS Focke.

A Chinese bramble with glabrous cordate leaves, white tomentose beneath, and small purplish flowers followed by black fruits. Native to Hupeh Province. (Adapted from *Focke, Species Ruborum, p. 1, p. 52.*)

For previous introduction, see S. P. I. No. 52942.

53537. RUBUS OMEIENSIS Rolfe.

A large, unarmed, straggling shrub with maplelike leaves, downy beneath, deeply divided stipules one-half to three-quarters of an inch long, and terminal, many-flowered panicles. The purple flowers, half an inch across, are followed by black, well-flavored fruits ripening late. Native to western China and found on Mount Omei. It grows up to 6,000 feet altitude and will probably be perfectly hardy. It makes growths 10 to 12 feet long in a season. (Adapted from *Bean, Trees, and Shrubs Hardy in the British Isles, vol. 2, p. 465.*)

For previous introduction, see S. P. I. No. 40195.

53538. RUBUS THIBETANUS Franch.

An attractive, deciduous, Chinese shrub with purplish stems and dark lustrous green leaves, white felted below. The purple flowers, half an inch across, are followed by black roundish fruits of the same diameter, covered with a bluish bloom. (Adapted from *Focke, Species Ruborum, pt. 1, p. 179.*)

For previous introduction, see S. P. I. No. 42592.

53535 to 53540—Continued.

53539. RUBUS VEITCHII Rolfe.

An ornamental Chinese plant with pinnate leaves 3 inches long, silvery glaucous above and whitish beneath. The double pink flowers are not very freely produced. (Adapted from *The Garden, vol. 79, p. 518.*)

53540. RUBUS XANTHOCARPUS Bur. and Franch.

A perennial Chinese climber, 1 to 4 feet long, sparsely prickly or unarmed, which dies to the ground every year. The edible fruit is composed of many golden yellow drupes. It is cultivated for the fruit in Lithuania. Native to central and northwestern China. (Adapted from *Focke, Species Ruborum, pt. 1, p. 129.*)

For previous introduction, see S. P. I. No. 1004.

53541. TRIFOLIUM GLOMERATUM L. Fabaceæ. Cluster clover.

From Melbourne, Victoria. Seeds presented by Messrs. Law, Somner, & Co. Received May 14, 1921.

Introduced for experiments by department specialists.

For previous introduction, see S. P. I. No. 53007.

53542. BRASSICA RUGOSA (Roxb.) Prain. Brassicaceæ. Palangi.

From Calcutta, India. Seeds presented by Lieut. Col. A. T. Gage, director, Botanical Survey of India. Received May 16, 1921.

An early cold-weather crop in the hills of the central, eastern, and western Himalayas. The permanent radical leaves form a loose cabbagelike head 1 foot in diameter. Later a stoutish stem, 4 to 6 feet high, is formed, its branches ascending to make a narrow pyramidal head 6 to 10 inches across. The succulent leaves, 12 to 15 inches long and 8 to 9 inches wide taper into thick white fleshy stalks 3 to 4 inches long and over an inch wide. The plant is cultivated in Nepal, where its leaves are plucked almost as fast as they are developed and used as a vegetable. An oil is extracted from the seeds. (Adapted from *The Agricultural Ledger, vol. 5, p. 11.*)

For previous introduction, see S. P. I. No. 46479.

53543 and 53544.

From Algiers, Alger'a. Seeds presented by Dr. L. Trabut. Received May 18, 1921.

53543. HYOSCYAMUS MUTICUS L. Solanaceæ.

"A medicinal plant rich in hyoscyamine, from the Sudan." (*Trabut.*)

A thick-stemmed perennial with fleshy ovate leaves 4 inches long and violet-spotted whitish flowers nearly an inch in length. Like the henbane (*H. niger*) this plant, which is native to Egypt and western Asia, is likewise rich in hyoscyamine and is used medicinally. (Adapted from *Muschler, Manual Flora of Egypt, vol. 2, p. 853.*)

53544. TRITICUM DURUM Desf. Poaceæ. Durum wheat.

"*Pelissier de Facé.* Hard wheat from the Medea region, 1920." (*Trabut.*)

53545. RUBUS sp. Rosaceæ. Blackberry.

From Ecuador. Seeds presented by George K. Cherrie, Newfane, Vt. Received May 23, 1921.

"A blackberry that I found growing in great abundance at a point known as Sabanilla on the River Zamora. The locality is at an altitude of about 5,500 feet, in the Ecuadorian 'Oriente.' The seeds were collected November 10, 1920, which must have been the height of the fruiting season. I do not believe I have ever seen such tremendous clusters of berries. On some of the bushes blossoms as well as ripe fruit were to be seen. The berries are large and to me were very fine flavored." (*Cherrie.*)

53546. DIGITARIA EXILIS (Kippist) Stapf. Poaceæ. **Fundi.**

From Kew, England. Seeds presented by Sir David Prain, director, Royal Botanic Gardens. Received May 24, 1921.

"*Atcha* from Aburi; used by the natives as a delicacy in food, being cultivated for that purpose. The seeds are ground and made into a sauce." (*Prain.*)

For previous introductions, see S. P. I. No. 52736.

53547. ALEURITES MOLUCCANA (L.) Willd. Euphorbiaceæ. **Lumbang.**

From Los Angeles, Calif. Seeds presented by Russell C. Westcott. Received May 24, 1921.

"*Candlenut.* The tree, purchased in Santa Barbara, is about 20 years old and is now growing on the lawn. It is about 40 feet high and has formed a round head. The tree has never been injured by frost except in the freeze of 1912 when it was killed back to the main branches, but quickly recovered.

"These candlenuts are edible but are slightly laxative. The tree bore over a bushel of nuts last year, which is the largest crop it has ever had. It produces about two crops annually, although there are blossoms and nuts on it most of the time." (*Westcott.*)

For previous introduction, see S. P. I. No. 52755.

53548. TRITICUM AESTIVUM L. Poaceæ. **Wheat.**
(*T. vulgare* Vill.)

From Rieti, Italy. Seeds presented by N. Strampelli, director, R. Statione Sperimentale di Granicoltura. Received May 25, 1921.

"*Carlotta Strampelli.* A wheat which thrives in any soil in any position; it produces best, however, in fresh, deep, fertile, moderately worked soil. The seeds should be sown early, preferably in rows." (*Strampelli.*)

53549 to 53554.

From Hamburg, Germany. Seeds presented by Ernst & Von Spreckelsen. Received May 28, 1921.

The following types were introduced for experimental work:

53549. LUPINUS ANGUSTIFOLIUS L. Fabaceæ. **Blue lupine.**

53550. LUPINUS LUTEUS L. Fabaceæ. **Yellow lupine.**

53551. ORNITHOPUS SATIVUS Brot. Fabaceæ. **Serradella.**

53552 to 53554. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

53552. Strain 1.
53553. Strain 2.
53554. Strain 3.

53555. DIOSPYROS DISCOLOR Willd. Diospyraceæ. **Mabolo.**

From Manila, Philippine Islands. Budded seedlings presented by Sr. Adn. Hernandez, Director of Agriculture, Department of Agriculture and Natural Resources, through P. J. Wester, horticulturist in charge, Lamao Experiment Station. Received June 25, 1921.

"Small budded seedless *mabolos*, variety *Manila*, from the original tree in Manila. Among the less well-known tropical fruits that are commonly propagated from seed, the *mabolo* is the first species to permanently contribute to tropical pomology a seedless fruit of greatly improved quality. During the past dry season experiments were made at Lamao that yielded very satisfactory results, and it was found that the *mabolo* is readily shield-budded. The ordinary *mabolo*, a medium-sized Philippine tree of vigorous growth and a desirable ornamental, with shining leaves 5 to 10 inches long, pubescent beneath, bears velvety, dull reddish, thin-skinned fruits 3 inches long and 3½ inches in

diameter, with whitish, firm, rather dry, sweet flesh of rather indefinite flavor, and four to eight large seeds.

"Notwithstanding its size and attractive appearance it has never gained the favor of the European, although very popular with the natives. This seedless variety is oblate, sweet, and juicy, and of good flavor, absolutely coreless, and without seed. Like the banana, the entire fruit is edible, the thin skin excepted, and it is a very superior fruit. According to the owner of the trees, 80 per cent of the fruit is seedless; the remainder contains from one to three seeds." (*Wester.*)

53556. FERRARIA WELWITSCHII Baker. Iridaceæ.

From Bela Vista, Angola. Bulbs presented by H. A. Neipp. American Mission. Received June 28, 1921.

"A number of bulbs, which may be of some interest should they blossom in America." (*Neipp.*)

53557. BROMUS UNIOLOIDES (Willd.) H. B. K. Poaceæ. **Brome-grass.**

From Vlakfontein, Colesberg, South Africa. Seeds presented by Col. A. J. Bester. Received May 25, 1921.

"*Rescue grass.* A grass which grows in the most exposed parts during the winter." (*Bester.*)

For previous introduction, see S. P. I. No. 34806.

53558 to 53562. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

From Bombay, India. Seeds presented by Grindlay & Co., through the Director of Agriculture, Bombay Department of Agriculture. Received May 28, 1921.

For experimental work of the Office of Forage-Crop Investigations.

53558. *Bile Fulgar.*
53559. *Hasarbija.*
53560. *Pattansali.*
53561. *Sadgar Nandyal.*
53562. *Yidgamfu.*

53563 to 53590.

From Allahabad, United Provinces, India. Seeds collected by Dr. L. A. Kenoyer and Winfield Dudgeon, Ewing Christian College. Received May 27, 1921. Quotes notes by Mr. Dudgeon.

53563. ACACIA CAESIA (L.) Willd. Mimosaceæ.

"A scandent shrub in pioneer monsoon-deciduous forests of peninsular India. Collected at Shankargarh, 25 miles south of Allahabad, April 8, 1921."

The flowers of this climbing shrub are pale yellow and are borne in stalked globose heads forming large panicles. Native to the Dekkan and Canara. (Adapted from *Cooke, Flora of Bombay, vol. 1, p. 451.*)

For previous introduction, see S. P. I. No. 30776.

53564. ACACIA LEUCOPHLOEA (Roxb.) Willd. Mimosaceæ.

"A conspicuous component of survival thorn scrub on the Indo-Gangetic Plains, and a pioneer in forest areas of peninsular India. Collected at Shankargarh, 25 miles south of Allahabad, April 8, 1921."

A large, fast-growing tree with yellowish bark used in the distillation of spirit. The bark also yields a strong fiber said to be much valued for fishing nets. Native to the plains of the Punjab and Rajputana and the forests of central and southern India and Burma. (Adapted from *Watt, Commercial Products of India, p. 15.*)

For previous introduction, see S. P. I. No. 33432.

53563 to 53590—Continued.

53565. ANOGEISSUS LATIFOLIA (Roxb.) Wall. Combretaceæ.

"Collected at Manikpur, April 21, 1920, in the forests of the low Vindhya Mountains."

A tree 60 to 70 feet high, with smooth, light-colored bark and pale, dull glaucous green leaves with a pink midrib. The small yellow flowers are in dense heads. The tree yields a useful gum, and the wood is very strong and tough. (Adapted from *Cooke, Flora of Bombay, vol. 1, p. 482.*)

For previous introduction, see S. P. I. No. 52283.

53566. ANOGEISSUS SERICEA Brandis. Combretaceæ.

"A medium-sized tree in monsoon-deciduous forests of peninsular India. Collected at Shankargarh, near Allahabad, India, April 8, 1921."

A tree with leaves silky pubescent beneath, and yellow flowers in globose heads, one-half to three-quarters of an inch in diameter. The small, leathery, winged fruits are tomentose. Native to Gujarat and Central Provinces, India. (Adapted from *Cooke, Flora of Bombay, vol. 1, p. 482.*)

53567. BAUHINIA VAHLII Wight and Arn. Cæsalpiniaceæ.

"A characteristic gigantic climber in climax monsoon-deciduous forests throughout peninsular India and up to 5,000 feet in the Himalayas. Collected in the upper (Himalayan) Ganges Valley, June 1, 1920. I should think it would stand a climate about like that of Virginia."

A climber, sometimes 100 feet long, covered with red-brown tomentum. The large terminal corymbs are composed of white flowers with petals an inch long, turning to cream-yellow. This species is put to more uses than almost any other forest plant except the bamboo. The large flat leaves are sewed together and used as plates, cups, rough tablecloths, umbrellas, cloaks, and rain capes; the seeds are roasted and eaten; the fibers of the bark are made into ropes; and a gum exudes copiously. Native to central and northern India, ascending to 5,000 feet; native name *taur*. (Adapted from *Collett, Flora Simlensis, p. 149.*)

For previous introductions, see S. P. I. No. 33559.

53568. BAUHINIA VARIEGATA L. Cæsalpiniaceæ.

"Native to the climax monsoon-deciduous forests throughout peninsular India and up to 5,000 feet in the Himalayas. Collected in the upper (Himalayan) Ganges Valley at Dharassu, June 1, 1920. I should think it would stand a climate about like that of Virginia."

A moderate-sized tree with short racemes of fragrant flowers, rose colored and variegated with red and yellow. Cultivated throughout India. The light or reddish brown wood is used for agricultural implements. The astringent bark is used for tanning and dyeing; the leaves and flower buds are eaten as vegetables; and the flower buds are often pickled. (Adapted from *Brandis, Forest Flora of India, p. 160.*)

For previous introduction, see S. P. I. No. 32787.

53569. BOSWELLIA SERRATA Roxb. Balsameaceæ.

"Collected near Manikpur, in the forests of the low Vindhya Mountains, April 21, 1920."

A large tree, native to the mountains of India, with pinnate, hairy leaves, racemes of small pink flowers, and smooth capsules the size of an olive. This tree yields a most fragrant resin known as Indian olibanum, used as an ingredient in incense and various ointments. The rough, moderately hard timber is recommended for tea boxes and is used for fuel, for making charcoal, and for the manufacture of doors, bowls, etc. The tree enjoys a considerable immunity from being browsed or lopped for fodder, owing to its resinous leaves, and it has a great capability for withstanding forest fires. It is thus valuable in the reclothing of dry hills. (Adapted from *Transactions of the Asiatic Society in Bengal, vol. 9, p. 379,* and *Watt, Commercial Products of India, p. 174.*)

53563 to 53590—Continued.

53570. CASSIA FISTULA L. Cæsalpiniaceæ.

"Common in pioneer monsoon-deciduous forests throughout peninsular India and up to 4,000 feet in the Himalayas. Collected at Shankargarh, 25 miles south of Allahabad, India, April 8, 1921."

A moderate-sized tree with large, bright-yellow, fragrant flowers in lax, pendulous racemes 1 to 2 feet long. Common throughout India in the forest tracts in Trans-Indus on the hills near Peshawar, and ascends to 4,000 feet in the outer Himalayas. The red wood is beautifully mottled and streaked, hard, tough, is easily worked, and takes a fine polish, but is somewhat brittle and apt to crack. It is, however, very durable and is used for posts, plows, etc. The bark is used for tanning and dyeing, and red juice exudes from wounds in the bark, which hardens into a gum used like kino. The twigs and leaves are lopped for cattle fodder in Oudh and Kumaon. (Adapted from *Brandis, Forest Flora of India, p. 164.*)

For previous introduction, see S. P. I. No. 32316.

53571. CLERODENDRUM INFORTUNATUM Gaertn. Verbenaceæ.

"A component of survival woody vegetation of the plains, where human pressure is heavy. Collected at Shankargarh, 25 miles south of Allahabad, India, April 8, 1921."

An ornamental shrub 3 to 8 feet high, with white, sweet-scented flowers tinged with pink, followed by small black drupes seated on an enlarged pink calyx which sometimes reaches over an inch across the lobes when spread out. The large leaves, 4 to 10 inches long, are 3 to 8 inches wide. (Adapted from *Cooke, Flora of Bombay, vol. 2, p. 432.*)

53572 and 53573. DIOSPYROS TUPRU Buch.-Ham. Diospyraceæ.

A small tree with woolly branchlets and leathery leaves over 3 inches long. The smooth globose fruits are three-fourths of an inch in diameter. Native to the west Dekkan peninsula. (Adapted from *Hooker, Flora of British India, vol. 3, p. 563.*) Received as *Diospyros tomentosa* Roxb., which is now referred to *D. tupru.*

53572. "Collected at Manikpur, April 21, 1920."

53573. "A small tree characteristic in the pioneer monsoon-deciduous forests of peninsular India. Collected at Shivpuri (Sipri), Gwalior State, India, April 2, 1921."

53574. ERIOLAENA HOOKERIANA Wight and Arn. Sterculiaceæ.

"Collected near Manikpur, in the forests of the low Vindhya Mountains, April 21, 1920."

A south Indian shrub or small tree with cordate leaves and few-flowered, lax racemose cymes of long-peduncled flowers 1½ inches across. (Adapted from *Cooke, Flora of Bombay, vol. 1, p. 131.*)

53575. EUPHORBIA ROYLEANA Boiss. Euphorbiaceæ.

"A treelike Euphorbia on the rocky cliffs and talus slopes in the range of the Bauhinia monsoon-deciduous forest in the outer Himalayas, at altitudes of 3,000 to 5,500 feet. Collected at Dharassu, upper (Himalayan) Ganges Valley, June 1, 1920. I should think this would stand a climate about like that of Virginia."

A large shrub of cactuslike aspect attaining a height of 15 feet, with ascending 2 to 7 angled, thorny stems, 2 to 3 feet in girth. The sessile entire caducous leaves are inserted along the angles of the branches, and the yellow involucres, half an inch in diameter, are borne in sessile cymes. The milk contains a large amount of gutta-percha which has a sweet odor when fresh and is believed to be of value as a waterproofing material or as a paint for ships. (Adapted from *Collett, Flora Simlensis, p. 446,* and from *Watt, Commercial Products of India, p. 531.*)

53563 to 53590—Continued.

53576. FLACOURTIA SEPIARIA Roxb. Flacourtiaceæ.

"A common pioneer in the thorn forest over rocky peninsular India, and in the survival thorn scrub on the Indo-Gangetic Plains. Collected at Shankargarh, 25 miles south of Allahabad, April 8, 1921."

A shrub with long thorns; the stiff, glabrous, elliptic leaves are from one-half to 1½ inches long, and the small greenish flowers are solitary or in racemose clusters shorter than the leaves. Common in the hilly parts of the Konkan and Dekkan. (Adapted from *Cooke, Flora of Bombay, vol. 1, p. 56.*)

For previous introduction, see S. P. I. No. 34093.

53577. GARDENIA LATIFOLIA Ait. Rubiaceæ.

"Collected near Manikpur, in the forest of the low Vindhya Mountains, April 21, 1920."

A small tree 30 feet high, with a rounded head of dark-green glossy foliage and large, terminal, solitary, fragrant, white flowers which turn yellow in the evening; the corolla tube is 2 to 3 inches long. The white, yellowish tinged wood is close and fine grained, easily worked, and durable; combs are made of it, and it has been recommended for engraving and turner's work. Common in dry places in India except in the west. (Adapted from *Brandis, Forest Flora of India, p. 271.*)

53578. HIPTAGE BENGHALENSIS (L.) Kurz. Malpighiaceæ.
(*H. madablota* Gaertn.)

"An evergreen climber throughout India in climax monsoon-deciduous forests. Collected at Uttarkashi, upper (Himalayan) Ganges Valley, May 25, 1920. Will probably grow in a climate similar to that of Virginia."

A tall, climbing shrub with thick, entire glabrous leaves, 4 to 6 inches long and showy, fragrant flowers three-fourths of an inch across, in axillary racemes forming a terminal leafy panicle. The silky white petals have fringed, wavy margins, and the uppermost bears a large yellow spot. Native throughout India, in ravines and moist places, ascending to 3,000 feet. (Adapted from *Collett, Flora Simlensis, p. 56.*)

For previous introduction, see S. P. I. No. 33573.

53579. HOLARRHENA ANTIDYSENTERICA (Roth) Wall. Apocynaceæ.

"Collected near Manikpur, in the forest of the low Vindhya Mountains, April 21, 1920."

A small tree native throughout India, ascending to 3,500 feet, with corymbose cymes of white flowers which have a tube and ovate lobes half an inch long. Both bark and seeds of this plant are among the most important medicines of the Hindus. This is the true *conessi* or *kurtchi* bark and exfoliates in patches; it is astringent, antidysenteric, and anthelmintic. The seed yields a fixed oil and the wood ash is used in dyeing. The soft white wood is largely used for carving, furniture, and turnery. (Adapted from *Collett, Flora Simlensis, p. 311*, and *Watt, Commercial Products of India, p. 640.*)

For previous introduction, see S. P. I. No. 47692.

53580. JUSTICIA ADHATODA L. Acanthaceæ.
(*Adhatoda vasica* Nees.)

"A small survival shrub characteristic to the thorn scrub of peninsular India; and a woody ruderal in overpopulated areas throughout India. It is a pioneer in monsoon-deciduous forests and common up to 4,500 feet in the Himalayas. Collected at Dharassu, upper (Himalayan) Ganges Valley, June 1, 1920, in the Bauhinia forest range. Suitable, I should think, to a climate about like that of Virginia."

A glabrous shrub 4 to 8 feet high, native to India, with white flowers which are streaked and dotted with pink and are 1 to 2 inches long and borne in erect spikes 1 to 3 inches long. (Adapted from *Collett, Flora Simlensis, p. 376.*)

53563 to 53590—Continued.

53581 and 53582. LAGERSTROEMIA PARVIFLORA Roxb. Lythraceæ.

A large tree, native to the Dekkan Peninsula and at the base of the western Himalayas at altitudes of 1,000 feet, which attains a height of 50 to 70 feet with a straight stem often 30 feet to the first branch. The leathery leaves, green and glabrous above, pale or sometimes hoary tomentose beneath, are used to feed tasar silkworms. The white fragrant flowers, half an inch across, are in axillary or terminal panicles. The wood is valued for its timber, which is tough, elastic, and durable. (Adapted from *Cooke, Flora of Bombay, vol. 1, p. 612*, and *Brandis, Forest Flora of India, p. 239.*)

For previous introduction, see S. P. I. No. 47703.

53581. "Collected at Manikpur, in the forests of the low Vindhya Mountains, April 21, 1920."

53582. "A component of pioneer monsoon-deciduous forests of peninsular India. Collected at Shankargarh, 25 miles south of Allahabad, India, April 8, 1921."

53583. LEUCOMERIS SPECTABILIS D. Don. Asteraceæ.

"A small tree composite, common in pioneer forest preceding climax Bauhinia forests in the outer Himalayas. Collected at Dharassu, upper (Himalayan) Ganges Valley, June 1, 1920. Suitable probably to a climate like that of Virginia."

A shrub or small tree native to western Himalayan regions at altitudes of 2,000 to 5,000 feet, with entire glabrous leathery leaves densely velvety tomentose beneath, 4 to 14 inches long, and 1½ to 4 inches wide, narrowed at both ends. The white flowers half an inch long are in rounded corymbs, 4 to 8 inches in diameter. The achenes are densely silky with copious pappus. (Adapted from *Hooker, Flora of British India, vol. 3, p. 386.*)

53584. MALLOTUS PHILIPPINENSIS (Lam.) Muell. Arg. Euphorbiaceæ.

"Common in pioneer monsoon-deciduous forests of the outer Himalayas up to 5,000 feet. Collected at Dharassu, upper (Himalayan) Ganges Valley, June 1, 1920. Suitable, I should think, to a climate about like that of Virginia."

A small dioecious tree with long-stalked leaves glabrous above and rusty tomentose beneath and minutely scarlet dotted. The globose scarlet capsules, one-third of an inch in diameter, are covered with a bright-red powder which is collected for export to be used for dyeing silk and in medicine. Native to India, ascending to 4,500 feet. (Adapted from *Collett, Flora Simlensis, p. 453.*)

53585. MAXIMILIANEA GOSSYPIUM (L.) Kuntze. Cochlospermaceæ. (*Cochlospermum gossypium* DC.)

"Collected near Manikpur, in the forest of the low Vindhya Mountains."

A small tree with palmately lobed leaves, white tomentose beneath, and bright-yellow flowers 4 to 5 inches in diameter, in terminal panicles. Found on a few of the Konkan and Dekkan Hills and often planted near temples. (Adapted from *Cooke, Flora of Bombay, vol. 1, p. 53.*)

For previous introduction, see S. P. I. No. 43381.

53586. NATHUSIA SWIETENIOIDES (Roxb.) Kuntze. Oleaceæ. (*Schrebera swietenioides* Roxb.)

"A tree commonly met in climax forests of peninsular India. Collected at Shivpuri (Sipri), Gwalior State, India, April 2, 1921."

A tree 40 to 50 feet high, with smooth pinnate leaves 4 inches long and white, brown-marked flowers, often 100 in each cyme. Native to the tropical Himalayas and the Dekkan Peninsula at altitudes of 1,000 to 4,000 feet, and to Pegu, India. (Adapted from *Hooker, Flora of British India, vol. 3, p. 604.*)

53563 to 53590—Continued.

53587. RANDIA ULIGINOSA (Retz.) Poir. Rubiaceæ.

"Collected near Manikpur, in the forests of the low Vindhya Mountains, April 21, 1920."

A small tree rarely reaching 20 feet high, with reddish brown, scaly bark, thick horizontal branches, many of them terminating in one to two pairs of strong sharp thorns half an inch long. The thin glabrous leaves, pubescent beneath, are clustered on suppressed branchlets. The solitary, fragrant, white flowers are 1 to 2 inches in diameter. The smooth, ovoid yellowish brown fruits, 2 to 3 inches long and containing numerous smooth seeds closely packed in pulp, are eaten after being boiled or roasted. Native throughout the Bombay Presidency. (Adapted from *Cooke, Flora of Bombay, vol. 1, p. 699.*)

For previous introduction, see S. P. I. No. 47769.

53588. STERCULIA URENS Roxb. Sterculiaceæ.

"A fine large tree commonly met in peninsular Indian climax deciduous forests, or farther south, in forests immediately preceding the climax. Collected at Shivpuri (Sipri), Gwalior State, India. To be grown where there is little or no danger of frost."

A large Indian tree with a straight trunk and white, smooth, papery bark, the outer surface thin and peeling off, the inner coat fibrous and netted. The glabrous leaves, velvety beneath and 8 to 12 inches long, are crowded at the ends of the branches. The numerous small yellow flowers are in terminal panicles appearing before the leaves. A gum called *katila*, which has been used as an inferior substitute for tragacanth (itself used as a substitute for gum arabic in medicine and in the arts) is obtained from the tree; the seeds are roasted and eaten by the poorer natives and in some parts of India are ground and used as a kind of coffee. (Adapted from *Cooke, Flora of Bombay, vol. 1, p. 123.*)

53589. TERMINALIA TOMENTOSA (Roxb.) Wight and Arn. Combretaceæ.

"A climax tree (dominant with *Tectona grandis* farther south) of monsoon-deciduous forests of peninsular India. Collected at Shivpuri (Sipri), Gwalior State, India, April 2, 1921."

A large tree, 80 to 100 feet high, with hard coriaceous leaves 5 to 9 inches long and dull-yellow flowers in erect terminal panicles. A common tree in the moister regions of India; it thrives best in heavy binding soils. The dark-brown wood, mottled with darker streaks, is used in northern India for house building, etc.; it is an excellent fuel and furnishes good charcoal; potash is made of it. The bark is used for tanning and the ashes of the bark are chewed with the betel leaf. The common tasar silkworm feeds on the leaves; lakh is occasionally gathered on the branches, and in Oudh and the Northwest Provinces the leaves are lopped for cattle fodder. (Adapted from *Brandis, Forest Flora of India, p. 226.*)

For previous introduction, see S. P. I. No. 47856.

53590. TRITICUM ÆSTIVUM L. Poaceæ. Common wheat.
(*T. vulgare* Vill.)

"Purple-stemmed wheat from the Himalayan portion of the Ganges Valley, at Ballu. Collected May 28, 1920. Should grow in a climate like that of Virginia."

53591. EUGENIA LUMA (Molina) Berg. Myrtaceæ.
(*E. apiculata* DC.)

From San Francisco, Calif. Seeds presented by John McLaren, superintendent, Golden Gate Park. Received April 23, 1921.

An ornamental Chilean shrub bearing small edible fruits reported to have a "refreshing flavor."

53592 and 53593.

From Allahabad, United Provinces, India. Seeds collected by Dr. L. A. Kenoyer and Winfield Dudgeon, Ewing Christian College. Received May 27, 1921. Quoted notes by Mr. Dudgeon.

53592. VALLARIS HEYNEI Spreng. Apocynaceæ.

"A twining shrub in pioneer places throughout India. Collected at Dharassu, upper (Himalayan) Ganges Valley, June 1, 1920. Adapted to a climate similar to that of Virginia."

A climbing shrub with white, fragrant flowers, three-fourths of an inch across, in axillary drooping cymes. The oblong, pointed fruits are 6 inches long. Native to the Sutlej Valley and throughout India, ascending to 5,000 feet. It is often cultivated in gardens. (Adapted from *Collett, Flora Simlensis, p. 311.*)

53593. ZIZIPHUS XYLOPYRUS (Retz.) Willd. Rhamnaceæ.

"A small thorny tree characteristic in thorn forests pioneer to monsoon-deciduous forests of peninsular India. Collected at Shivpuri (Sipri), Gwalior State, India, April 2, 1921."

A straggling shrub or, in favorable situations, a tree, with smooth leaves covered beneath with white or yellowish tomentum. The yellowish white to brownish wood is hard and tough, easily worked, and durable, and is used for cart-building and other purposes. The bark is used for tanning; the young shoots, leaves, and fruits serve as fodder for cattle and goats. The hard dry fruit is charred and makes a black dye for leather. The edible kernels are inclosed two to three in a large, thick, hard stone. Native to India and dry hot places in Ceylon. (Adapted from *Cooke, Flora of Bombay, vol. 1, p. 242,* and *Brandis, Forest Flora of India, p. 90.*)

53594. ANNONA CHERIMOLA Mill. Annonaceæ. Cherimoya.

From Buenos Aires, Argentina. Seeds presented by D. S. Bullock, agricultural trade commissioner, United States Department of Agriculture, American Legation. Received June 18, 1921.

"Seeds of the *cherimoya* from Salta, Argentina." (*Bullock.*)

A tree 15 to 25 feet high, native to Ecuador and Peru. The fruit, considered by many people to be the most delicious of tropical dessert fruits, is light green, thin skinned, somewhat oval, with white, juicy, melting flesh of subacid delicate flavor suggestive of the pineapple and banana. Numerous black seeds are embedded in the flesh. Analysis of the fruit in Hawaii shows percentages as follows: Total solids, 33.81; ash, 0.66; acids, 0.06; protein, 1.83; total sugars, 18.41; fat, 0.14; fiber, 4.29.

Seedlings bear the third or fourth year and produce at least a dozen good fruits. A tree in Madeira is said to have produced 300 fruits in one season. (Adapted from *Popenoe, Manual of Tropical and Subtropical Fruits, p. 161.*)

For previous introduction, see S. P. I. No. 52375.

53595 to 53606. ZEA MAYS L. Poaceæ. Corn.

From Buenos Aires, Argentina. Seeds presented by D. S. Bullock. Received May 18, 1921. Quoted notes by Mr. Bullock.

53595. "1920 harvest."

53596. "1921 harvest."

53597. "*Maiz amarillo viejo,* 1920 harvest. From Luis Dreyfus & Co."

53598. "*Maiz colorado,* 1921 harvest. From Luis Dreyfus & Co."

53599. "*Maiz morocho,* 1920 harvest. From Luis Dreyfus & Co."

53600. "*Maiz colorado viejo,* 1920 harvest. From Luis Dreyfus & Co."

53601. "*Maiz amarillo,* 1920 harvest. From Grain Exchange of Buenos Aires."

53595 to 53606—Continued.

53602. "*Maiz colorado*, 1920 harvest. From Grain Exchange of Buenos Aires."

53603. "*Maiz amarillo canario*, 1920 harvest. From Grain Exchange of Buenos Aires."

53604. "*Maiz morocho perla*, 1920 harvest. From Grain Exchange of Buenos Aires."

53605. "*Maiz colorado Cuarenteno*, 1920 harvest. From Grain Exchange of Buenos Aires."

53606. "*Maiz morocho*, 1920 harvest. From Grain Exchange of Buenos Aires."

53607. Coronilla varia L. Fabaceæ.

From Stockholm, Sweden. Seeds presented by Dr. Robert E. Fries, director, Hortus Botanicus Bergianus. Received May 25, 1921.

A free-flowering European plant which blooms from June until September in Chicago and is at its best in July. The peduncles are crowned with dense umbels of pink and white flowers, and the plant is a pleasing feature for rockeries, ledges, or dry and semishady banks. It is too rampant for the border. (Adapted from *Gardening, vol. 5, p. 337.*)

53608 and 53609.

From Buenos Aires, Argentina. Seeds presented by Sr. Benito Carrasco, director, Botanic Garden. Received May 25, 1921.

53608. Salpichroa rhomboidea (Gill. and Hook.) Miers. Solanaceæ.

An ornamental plant, native to Argentina, with very abundant leafy foliage and creeping, spreading branches which appear to be starred all over with small white flowers. The pretty, ivory-white, transparent berries somewhat resemble the pineapple in flavor and are eaten by the natives. The plant is very effective for covering bare arid spots where nothing else can be grown. It is hardy in Paris, France. (Adapted from *The Garden, vol. 35, p. 367.*)

53609. Ipomoea ficifolia Lindl. Convolvulaceæ. **Morning-glory.**

A large climber from the Kamerun region, with slender stems covered with starlike hairs and discolored leaves placed at intervals of 4 to 5 inches. The cymose inflorescence bears violet-rose, salver-shaped flowers 2 inches across and 2 inches long. The plant flowers from August until the middle of October. (Adapted from *The Gardeners' Chronicle, vol. 22, p. 410.*)

For previous introduction, see S. P. I. No. 8868.

53610. Dendrocalamus strictus (Roxb.) Nees. Poaceæ. **Bamboo.**

From Dehra Dun, India. Seeds presented by R. D. Hole, forest botanist, Forest Research Institute and College, through Col. Edwin S. George. Received May 27, 1921.

"Seeds of a beautiful bamboo which has tremendous commercial value." (*George.*)

A bamboo native to India and extending to Burma, which grows on drier ground than bamboos generally. It attains a height of 100 feet and its strength and solidity render it fit for many select technical purposes. This bamboo endures great cold as well as dry heat and is useful for the consolidation of embankments, on account of the network of fibrous roots. It occasionally forms forests of its own, seeds almost annually, which is exceptional among the Bambusaceæ, and is readily grown from seed. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 165.*)

For previous introduction, see S. P. I. No. 40889.

53611. CITRUS GRANDIS (L.) Osbeck. Rutaceæ.
(*C. decumana* Murr.)

From Guayaquil, Ecuador. Seeds presented by Dr. Frederic W. Goding, American consul general. Received May 26, 1921.

"A native Ecuadorian fruit, known locally as *toronja*, which has the appearance of a mammoth orange nearly as large as a medium-sized human head. The arrangement of the interior of the fruit resembles that of the orange, but the color is salmon and the taste an acid bitter similar to but more pronounced than that of the ordinary grapefruit, for which it is being used as a substitute in Ecuador.

"Were this fruit properly cultivated, so as to lessen the coarseness of its pulp, it would be prized as a food and would present an attractive appearance on the table." (*Goding.*)

53612 and 53613.

From Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received June 15, 1921. Quoted notes by Mr. Rock.

53612. ARISTOLOCHIA ACUMINATA Lam. Aristolochiaceæ.

"Collected between Raheng and Mesawt, Siam, in the rain forest at Pang Ma Kham Pom, 2-days' journey from Raheng, December 18, 1920. A vigorous vine, climbing over shrubs and trees. No flowers seen."

53613. CASSIA FISTULA L. Cæsalpiniaceæ.

"Seeds collected from trees growing wild near Palut, in dry forests with Strychnos, Lagerstroemia, and teak, between western Siam and Lower Burma on the way from Raheng to Mesawt, December 17, 1920. It is a medium-sized tree in these dry forests and is semideciduous in the winter. The yellow flowers are produced in long pendent racemes."

For previous introduction, see S. P. I. No. 32316.

53614. TABERNAEMONTANA DONNELL-SMITHII Rose. Apocynaceæ.

From the city of Guatemala, Guatemala. Seeds presented by Sr. Jorge G. Salas, Dirección General de Agricultura, through Sr. Francisco Villacorta, Guatemalan consul general in New York. Received June 29, 1921.

"Seeds from a large tree which produces the *goma de cojon* of commerce." (*Salas.*)

A large shrub 10 to 20 feet high, occurring in Guatemala from the coast up the slopes of the volcanoes to altitudes of 5,000 feet. The natives call it *cobal* (varnish gum). The thin oblong leaves are 3 to 8 inches long, and the large yellow salver-shaped flowers are in few-flowered cymes. (Adapted from *The Botanical Gazette, vol. 18, p. 206.*)

53615. ERAGROSTIS TREMULA Hochst. Poaceæ. **Grass.**

From Gizeh, Egypt. Seeds presented by Thomas W. Brown, director, Ministry of Agriculture, Horticultural Section. Received June 30, 1921.

An annual, tufted grass, found throughout the Tropics, with ascending or erect stems up to 3 feet in height and light-green, flat leaves tapering to a long point. (Adapted from *Muschler, Manual Flora of Egypt, vol. 2, p. 125.*)

53616. ROLLINIA EMARGINATA Schlecht. Annonaceæ. **Araticuy.**

From Horqueta, Paraguay. Seeds presented by Thomas R. Gwynn, through the American consul, Asuncion, Paraguay. Received June 23, 1921.

"*Chirimouia.* A large fruit, extremely aromatic; the seeds are full of oil." (*Gwynn.*)

For previous introduction, see S. P. I. No. 25528.

53617 to 53620. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From Poppelsdorf, Bonn, Germany. Tubers presented by Dr. E. Schaffnit. Received May 25, 1921.

"Potatoes known to be immune to the wart disease." (*Schaffnit.*)

53617. *Pepo.*
53618. *Rheingold.*
53619. *Thieler.*
53620. *Ursus.*

For previous introduction, see S. P. I. No. 33491.

53621. MELILOTUS ALBA Desr. Fabaceæ. **White sweet clover.**

From Groningen, Netherlands. Seeds presented by C. Broekema, director, Groninger Zaaizaadvereeniging. Received June 1, 1921.

Secured for experimental purposes.

For previous introduction, see S. P. I. No. 40937.

53622 and 53623.

From Tripoli, Libia, Africa. Seeds presented by Dr. E. O. Fenzi. Received June 1, 1921. Quoted notes by Dr. Fenzi.

53622. ELEUSINE CORACANA (L.) Gaertn. Poaceæ. **Ragi millet.**

"*Bescna.* The bescna appears to be more prized for forage than for grain, although the natives assure me that it will keep in perfect condition for 100 years. This and *gssab* [S. P. I. No. 53623] are practically the only summer forage plants grown by the Arabs, under irrigation, of course."

53623. PENNISETUM GLAUCUM (L.) R. Br. Poaceæ. **Pearl millet.** (*P. typhoideum* Rich.)

"*Gssab.* The seed of the gssab has a better taste than *bescna* and always commands a higher price on the market. It also grows taller than *bescna* and yields more forage, but will need also much more water. It is claimed that it will ripen seeds in 40 days from date of sowing, which statement, however, I can not guarantee. From what I know *P. glaucum* finds its northern cultural limit in Libia.

53624. AVENA SATIVA L. Poaceæ. **Oat.**

From Aberystwith, Wales. Seeds presented by R. G. Stapledon, director, Welsh Plant-Breeding Station. Received June 4, 1921.

"*Sir Douglas Haig.* A Welsh oat which has more than three grains in a spikelet and was produced by a cross with *Avena nuda* as one of the parents." (*L. E. Thatcher.*)

53625. RUBUS MACRAEI A. Gray. Rosaceæ. **Akala.**

From Honolulu, Hawaii. Seeds collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received June 6, 1921.

"Spineless variety from near Shipman Ranch, Kilauea, Hawaii. This variety grows epiphytically in the forks of large koa trees (*Acacia koa* Gray) and on fallen logs of the same species, inaccessible to cattle. The dark-red fruits attain a diameter of nearly 2 inches, are very juicy, and, though slightly bitter, are quite pleasant to the taste. The variety would likely improve under cultivation. The canes do not grow as straight as those of the yellow and red varieties on Mauna Kea (S. P. I. Nos. 53480 to 53482), but they are over an inch in diameter at the base; the whiplike branches are very scandent and rambling. These seeds came from a fern forest at an altitude of 4,500 feet on the slopes of Mauna Loa, Hawaii, May, 1921." (*Rock.*)

53626. AVENA BARBATA WIESTII (Steud.) Hausskn. Poaceæ. **Grass.**

From Gizeh, Egypt. Seeds presented by Thomas W. Brown, director, Ministry of Agriculture, Horticultural Section. Received June 7, 1921.

An erect, sparingly hairy grass up to 2 feet in height, with linear leaves up to 7 inches long. Secured for experimental purposes.

53627 to 53752.

From Kew, England. Seeds presented by Sir David Prain, director, Royal Botanic Garden. Received April 30, 1921.

53627 to 53649. BERBERIS spp. Berberidaceæ. **Barberry.**

53627. BERBERIS AGGREGATA C. Schneid.

A shrub native to thickets in western Szechwan at altitudes of 4,000 to 9,500 feet. It attains a height of 5 feet and bears dense racemes of small yellow flowers followed by salmon-red fruits. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 375.*)

For previous introduction, see S. P. I. No. 52454.

53628. BERBERIS ARISTATA DC.

"A tall-growing ornamental barberry which bears multitudes of large racemes of yellow flowers. Recommended as an ornamental park and garden shrub in the northern sections of the United States." (*F. N. Meyer.*)

Native to the temperate Himalayas, the Nilghiri Mountains, and Ceylon.

For previous introduction, see S. P. I. No. 40144.

53629. BERBERIS ATROCARPA C. Schneid.

An ornamental shrub, 3 to 5 feet tall, with leathery evergreen leaves, shining rich green above and yellowish green beneath. The shrub is native to western Szechwan and there is no other species in that section which has such jet black, almost globose fruits. (Adapted from *Sargent, Plantae Wilsonianae, vol. 3, p. 437.*)

53630. BERBERIS CHINENSIS Poir.

"A Chinese barberry, 1 to 3 feet high, found between bowlders and rocks at altitudes of 4,000 to 6,000 feet. It becomes very showy toward the end of summer when its berries, which are produced in great abundance, assume a bright coral-red color." (*F. N. Meyer.*)

For previous introduction, see S. P. I. No. 36737.

53631. BERBERIS DARWINII Hook.

An evergreen shrub from the island of Chiloe and south Chile, one of the most handsome shrubs for garden hedges. It is hardy in England and in Norway as far north as Christiania. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 74.*)

53632. BERBERIS DICTYOPHYLLA Franch.

A Chinese shrub 4 feet high, erect when young, semiarching with age. The bright grass-green leaves are intensely glaucous below. The stems are also glaucous. The small, pale-yellow flowers are followed by red berries. (Adapted from *The Gardeners' Chronicle, ser. 3, vol. 52, p. 243.*)

For previous introduction, see S. P. I. No. 49056.

53633. BERBERIS FRANCISCI-FERDINANDI C. Schneid.

A rather striking western Chinese barberry 10 feet high, with thin, bright-green leaves, panicles of pendulous yellow flowers, and scarlet oblong fruits half an inch long.

For previous introduction, see S. P. I. No. 52931.

53634. BERBERIS GAGNEPAINI C. Schneid.

A Chinese evergreen shrub 3 to 6 feet high, with leathery leaves, spiny on the margins, and delicate yellow flowers on red pedicels. The ellipsoid fruits are glaucous purple.

For previous introduction, see S. P. I. No. 40147.

53627 to 53752—Continued.

53635. BERBERIS HOOKERI Lem.
(*B. wallichiana* Hook., not DC.)

An erect ornamental spiny shrub 6 to 10 feet high, native to Nepal, with beautiful, spreading, hollylike leaves. The yellow sepals are tinged with red.

For previous introduction, see S. P. I. No. 53090.

53636. BERBERIS LYCIUM Royle.

A shrub, native to Simla and the western Himalayas at altitudes of 3,000 to 9,000 feet; with bright-green, lanceolate leaves paler below and pale-yellow flowers followed by ovoid violet berries covered with bloom. (Adapted from *Collett, Flora Simlensis, p. 22.*)

53637. BERBERIS ORTHOBOTRYS Bienert.

A shrub with somewhat corymbose flowers and oval fruits native to Sergal, Afghanistan, at altitudes of 9,000 to 11,000 feet. (Adapted from *Journal of the Linnean Society, vol. 19, p. 150.*)

For previous introduction, see S. P. I. No. 33021.

53638. BERBERIS POLYANTHA Hemsl.

A Chinese shrub, 6 to 9 feet high, with deep-yellow flowers and salmon-red fruits. Native to western Szechwan. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 376.*)

For previous introduction, see S. P. I. No. 47299.

53639. BERBERIS AGGREGATA PRATTII C. Schneid.

A western Chinese shrub, 6 to 10 feet high, with yellow flowers in narrow panicles and ovoid salmon-red fruits.

For previous introduction, see S. P. I. No. 44527.

53640. BERBERIS STAPFIANA C. Schneid.

A partly evergreen western Chinese shrub, 5 to 6 feet high, with spreading arching stems, pale-yellow flowers, and carmine-red fruits having a slight bloom.

For previous introduction, see S. P. I. No. 37975.

53641. BERBERIS SUBCAULIALATA C. Schneid.

An ornamental Chinese species with clustered lance-shaped leaves, glaucous beneath, and globular reddish yellow fruits.

For previous introduction, see S. P. I. No. 44529.

53642. BERBERIS THIBETICA C. Schneid.

A deciduous Chinese shrub, 3 to 4 feet tall, with purplish, glaucous branches, entire leaves whitish beneath, and yellow flowers followed by red berries. (Adapted from *Schneider, Handbuch der Laubholzkunde, vol. 2, p. 920.*)

For previous introduction, see S. P. I. No. 49931.

53643. BERBERIS THUNBERGII DC.

An extremely popular garden shrub which assumes brilliant autumn colors. Native to Japan. (Adapted from *Arnold Arboretum Bulletin of Popular Information, scr. 1, No. 33.*)

For previous introduction, see S. P. I. No. 27120.

53644. BERBERIS TISCHLERI C. Schneid.

A western Chinese shrub, 6 to 10 feet high, with papery leaves, shining green above and paler beneath. The yellowish red fruits are covered with a light bloom. (Adapted from *Sargent, Plantae Wilsonianae, vol. 5, p. 355.*)

For previous introduction, see S. P. I. No. 50288.

53627 to 53752—Continued.

53645. BERBERIS UMBELLATA Wall.

A hardy, subevergreen, Himalayan shrub about 3 feet high, with narrow leaves slightly glaucous beneath and umbellike racemes of yellow flowers.

For previous introduction, see S. P. I. No. 49932.

53646. BERBERIS VEITCHII C. Schneid.

A shrub with gracefully arching branches, native to western Hupeh, China; the leathery leaves are pale green and the bronze-yellow flowers have reddish outer surfaces. The black, broadly elliptic fruits are covered with a bloom. (Adapted from *Sargent, Plantae Wilsonianae, vol. 3, p. 438.*)

53647. BERBERIS WILSONAE Hemsl.

A beautiful, sometimes partially evergreen, Chinese shrub, 2 to 4 feet high, with abundant, roundish, coral-red berries, somewhat translucent. The leaves assume brilliant tints in autumn. (Adapted from *Curtis's Botanical Magazine, pl. 8414.*)

For previous introduction, see S. P. I. No. 40152.

53648. BERBERIS sp.

Received as *Berberis consimilis*, for which a place of publication has not been found.

53649. BERBERIS sp.

Received as *Berberis leichtlinii*, for which name a place of publication has not been found.

53650 to 53665. CLEMATIS spp. Ranunculaceæ. Clematis.

53650. CLEMATIS AETHUSIFOLIA LATISECTA Maxim.

A free-growing deciduous climber, 5 to 6 feet high, with a great profusion of pale-yellow, bell-shaped flowers. The beautiful downy leaves are 3 to 8 inches long. Native to northern China and Manchuria. (Adapted from *Curtis's Botanical Magazine, pl. 5642.*)

53651. CLEMATIS FUSCA Turcz.

A semiherbaceous climber 8 or 9 feet high, with long-pointed leaflets and solitary, reddish brown urn-shaped flowers which are hairy on the outer surface. Native to northeastern Asia. (Adapted from *Schneider, Handbuch der Laubholzkunde, vol. 1, p. 277.*)

For previous introduction, see S. P. I. No. 49936.

53652. CLEMATIS GLAUCA AKEBIOIDES (Maxim.) Rehd. and Wils.

A climber, 6 to 10 feet high, with bronzy yellow flowers, very abundant in dry, hot valleys at altitudes of 7,000 to 10,000 feet in western Szechwan. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 342.*)

53653. CLEMATIS GRATA Wall.

A woody climber with decompound panicles of cream-colored flowers and hairy leaves sometimes smooth above. Native to the temperate and subtropical Himalayas. (Adapted from *Hooker, Flora of British India, vol. 1, p. 3.*)

53654. CLEMATIS GRATA GRANDIDENTATA Rehd. and Wils.

A climbing shrub, 9 to 30 feet high, with smooth leaves, silky hairy below, and cream-colored flowers in axillary clusters of three at the tip of leafless panicles. Native to western Hupeh, China. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 338.*)

53627 to 53752—Continued.

53655. CLEMATIS INTERMEDIA Carr.

A beautiful subshrubby climber, with smooth pinnate leaves; flowers deep violet within, lilac without. The four to six elliptical corolla segments are rolled at the edge and the sharp points recurved. This vigorous hardy species is a hybrid between *Clematis viticella* and the Japanese *C. lanuginosa*. (Adapted from *Revue Horticole, vol. 37, p. 339.*)

53656. CLEMATIS PSEUDOFLAMMULA Schmalh.

For previous introduction, see S. P. I. No. 53141.

53657. CLEMATIS RECTA L.

An ornamental herbaceous perennial 2 to 3 feet high, with masses of large white panicles. Native to southern Europe.

For previous introduction, see S. P. I. No. 30768.

53658. CLEMATIS SPOONERI Rehd. and Wils.

A climbing shrub, 9 to 20 feet high, with silky hairy leaves, yellowish and shining below. The beautiful, thick-textured, white flowers, 3 to 4 inches across, are solitary or in pairs and are covered with dense yellow hair on the outer surfaces. The brown hairy achenes bear feathery styles 1½ inches long. Native to rocky, sun-exposed places of western Szechwan, China. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 334.*)

53659. CLEMATIS TANGUTICA (Maxim.) Korsh.

The handsomest yellow-flowered Clematis in cultivation, the largest flowers being about 4 inches across. The species reaches a height of 8 to 10 feet and bears gray-green leaves and solitary rich-yellow flowers, with long, slender-pointed sepals, downy outside and at the edges. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 367.*)

For previous introduction, see S. P. I. No. 52631.

53660. CLEMATIS VEITCHIANA Craib.

A Chinese woody climber with papery leaves and long loose clusters of gracefully drooping flowers.

For previous introduction, see S. P. I. No. 49938.

53661. CLEMATIS VITALBA L.

The common wild clematis of English hedges. In July it climbs up into the trees, covering them with its numerous panicles of greenish white, scented flowers. In winter its silky tufts adorn the hedgerows. (Adapted from *The Garden, vol. 53, p. 546.*)

53662. CLEMATIS VITICELLA L.

A partially woody climber growing 8 to 12 feet high and bearing solitary blue-purple or rose-colored flowers 1½ inches across. Native to southern Europe. (Adapted from *Schneider, Handbuch der Laubholzkunde, vol. 1, p. 285.*)

For previous introduction, see S. P. I. No. 49810.

53663. CLEMATIS sp.

Received as *Clematis serrata*, for which a place of publication has not been found.

53664. CLEMATIS sp.

Received as *Clematis thedriana*, for which a place of publication has not been found.

53665. CLEMATIS sp.

Received as *Clematis vernalis*, for which a place of publication has not been found.

53627 to 53752—Continued.

53666 to 53695. COTONEASTER spp. Malaceæ.

53666. COTONEASTER ACUTIFOLIA Turcz.

A bushy shrub, 5 to 7 feet high, native to northern and western China, with branches often pendulous. The dull-green leaves are paler and hairy beneath, and the white flowers are borne three or more in corymbs. The smooth reddish fruits, one-third of an inch in diameter, are finally black. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 405.*)

53667. COTONEASTER AFFINIS Lindl.

For previous introduction, see S. P. I. 53468.

53668. COTONEASTER AFFINIS BACILLARIS (Wall.) C. Schneid. (*C. bacillaris* Wall.)

A very graceful shrub, 15 feet high, spreading to a larger diameter. The white flowers, one-third of an inch across, are borne in clusters 1 to 2 inches across. The small, roundish fruits are purplish brown. Native to the Himalayas at altitudes up to 10,000 feet. The strong elastic wood is used for walking sticks and spear shafts in India. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 406.*)

For previous introduction, see S. P. I. No. 40162.

53669. COTONEASTER AFFINIS OBTUSA (Wall.) C. Schneid.

A Himalayan shrub 15 feet high with numerous white flowers on short, leaf-bearing branchlets. One of the prettiest of the genus. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 407.*)

53670. COTONEASTER AMOENA Wilson.

A much-branched shrub, 3 to 5 feet high, with dense-flowered clusters followed by scarlet fruits. Native to Yunnan, China. (Adapted from *Sargent, Plantae Wilsonianæ, vol. 1, p. 165.*)

For previous introduction, see S. P. I. No. 40174.

53671. COTONEASTER APICULATA Rehd. and Wils.

A deciduous shrub, 5 to 8 feet high, with shining green leaves, paler beneath, and small roundish fruits. Native to western Szechwan, China, in upland thickets at altitudes of about 10,000 feet. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 156.*)

53672. COTONEASTER BULLATA Bois.

One of the best of the new Chinese shrubs, 10 to 12 feet high, with abundant brilliant-red fruits on the upper sides of long arching shoots. The rosy white flowers soon fall, but the fruits make the plant very handsome toward the end of August. It fruits freely when the plant is only a foot high. (Adapted from *Gardening Illustrated, vol. 40, p. 4.*)

For previous introduction, see S. P. I. No. 43836.

53673. COTONEASTER BUXIFOLIA Wall.

An evergreen bush, 10 to 12 feet high, with long, arching, sparsely branched stems, with dark-green leaves which are smooth above and grayish woolly beneath. The white flowers, one-third of an inch across, are followed by clusters of round red fruits. Very useful and pretty as a screen. Native to the Nilgiri Hills. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 407.*)

For previous introduction, see S. P. I. No. 33035.

53627 to 53752—Continued.

53674. COTONEASTER DIELSIANA E. Pritz.

A shrub, 3 to 6 feet high, with arching stems, pinkish flowers, and red fruits, native to thickets of western Hupeh at altitudes of 4,000 to 6,000 feet. The small leaves turn deep reddish purple in the fall. (Adapted from *Arnold Arboretum, Bulletin of Popular Information, No. 15.*)

For previous introduction, see S. P. I. No. 43990.

53675. COTONEASTER DIVARICATA Rehd. and Wils.

A shrub, 3 to 6 feet high, with gracefully reflexed branches, shining leaves paler beneath, and rose-colored flowers. The red fruits are ovoid. Native to thickets of western Hupeh, China, at altitudes of 4,000 to 6,000 feet. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 157.*)

For previous introduction, see S. P. I. No. 38149.

53676. COTONEASTER FRANCHETII Bois.

An ornamental evergreen shrub 8 to 10 feet high, with gracefully arching branches, with lustrous green leaves covered with a thick whitish to pale-brown felt beneath. The white rose-tinged flowers are followed by orange-scarlet fruits covered with a grayish down. Native to Tibet and western China. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 409.*)

For previous introduction, see S. P. I. No. 45705.

53677. COTONEASTER FRIGIDA Wall.

A half-evergreen Himalayan shrub, 20 feet high, bearing large clusters of creamy white flowers followed by scarlet fruits. One of the most beautiful in flower and fruit, but not hardy in the north. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 867.*)

For previous introduction, see S. P. I. No. 47664.

53678. COTONEASTER FRIGIDA Wall.

Variety *aurea*. A yellow-fruited variety.

53679. COTONEASTER HARROVIANA Wilson.

A handsome shrub, 4 to 6 feet high, with somewhat leathery, partially evergreen leaves, shining dark green above and densely tomentose beneath, densely many-flowered corymbs 2 inches across, and white flowers with reddish purple anthers, succeeded by red fruits. Native to Yunnan, China. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 51, pl. 3,* and from *Sargent, Plantae Wilsonianae, vol. 1, p. 173.*)

53680. COTONEASTER HEBEPHYLLA Diels.

A graceful, spreading shrub, 6 to 10 feet high, with white flowers and violet anthers, native to moist open situations at the north end of Chung Tien Plateau at altitudes of 8,500 to 9,000 feet and to the Likiang Valley at altitudes of 8,500 to 14,000 feet. The flowers are clustered 6 to 16 in corymbs. (Adapted from *Notes from the Edinburgh Royal Botanic Garden, vol. 5, p. 273.*)

53681. COTONEASTER HENRYANA (C. Schneid.) Rehd. and Wils.

A deciduous, papery leaved shrub, 6 to 12 feet high, with green roughish leaves, ashy white tomentose beneath. The flat lax corymbs, 2 to 3 inches across, are composed of white flowers with purple anthers. The ovoid fruits are red. Native to western Hupeh and eastern Szechwan, China, in woodlands at altitudes of 4,000 to 6,000 feet. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 174.*)

For previous introduction, see S. P. I. No. 40167.

53627 to 53752—Continued.

53682. COTONEASTER HORIZONTALIS Decaisne.

An evergreen Chinese shrub three times as broad as it is tall. The foliage is very small, dark green, and shiny. The white or light-pink flowers are pretty, but the glory of the shrub is in its bright-red berries during the early winter months. (Adapted from *Pacific Garden, vol. 5, p. 11.*)

For previous introduction, see S. P. I. No. 43681.

53683. COTONEASTER LINDLEYI Steud.

A large shrub or small tree, with young branches downy, later bare, and dark brown. The partially evergreen leaves are dark green above and covered with a grayish felt beneath. The white flowers are produced 5 to 10 in a corymb and are succeeded by bluish black fruits. Native to the northwestern Himalayas. (Adapted from *Schneider, Handbuch der Laubholzkunde, vol. 1, p. 757.*)

53684. COTONEASTER LUCIDA Schlecht.

A beautiful deciduous shrub of bushy habit, 6 to 8 feet high, with hairy young wood which becomes smooth in a year. The bright-green leaves are whitish green beneath, and the rose-colored flowers are followed by black fruits. Native to Siberia and other parts of northern Asia. (Adapted from *Schneider, Handbuch der Laubholzkunde, vol. 1, p. 750.*)

For previous introduction, see S. P. I. No. 29967.

53685. COTONEASTER MELANOCARPA LAXIFLORA (Jacq.) C. Schneid.

A shrub with spreading branches, reaching a height of 6 feet. The dark-green leaves are grayish white tomentose beneath, and the flowers, 12 or more in elongated pendulous corymbs, are followed by black roundish fruits. Native to northern Europe and Siberia. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 866.*)

53686. COTONEASTER MICROPHYLLA Wall.

A dwarf, dense, usually procumbent shrub with small shining dark-green leaves pubescent beneath. The white solitary flowers, one-third of an inch in diameter, are followed by globose bright-red fruits. Native to China and the temperate Himalayas. (Adapted from *Collett, Flora Simlensis, p. 173.*)

53687. COTONEASTER MICROPHYLLA THYMIFOLIA (Loud.) Koehne.

A very dwarf, particularly elegant high alpine form with smooth green leaves pubescent beneath and small white flowers, solitary or in twos. These and the bright-red fruits are smaller than in the species itself. This variety can be grown from cuttings. Native to Nepal, Simla, and the eastern Himalayas. (Adapted from *Schneider, Handbuch der Laubholzkunde, vol. 1, p. 760.*)

53688. COTONEASTER MOUPINENSIS Franch.

The common cotoneaster in the thickets and margins of woods throughout western Szechwan at altitudes of 4,000 to 7,000 feet. It is 6 to 15 feet high, with white flowers and jet-black fruits. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 163.*)

For previous introduction, see S. P. I. No. 36739.

53689. COTONEASTER PANNOSA Franch.

A graceful, Chinese evergreen shrub 10 feet high with small grayish green leaves and round, deep-red fruits, considered one of the best winter-fruiting shrubs.

For previous introduction, see S. P. I. No. 40169.

53627 to 53752—Continued.

53690. COTONEASTER RACEMIFLORA (Desf.) Koch.

A low shrub from northern Africa and western Asia, with roundish leaves slightly hairy beneath, and short-stalked cymes of white flowers followed by red fruits.

Received as *Cotoneaster fontanesii*, for which *C. racemiflora* is the earlier name.

For previous introduction, see S. P. I. No. 44082.

53691. COTONEASTER ROTUNDIFOLIA Wall.

An ornamental Himalayan shrub, 4 to 5 feet high, clothed with dark-green, partially evergreen leaves. The small deep-scarlet berries are freely borne and are said to be less attractive to birds than those of other cotoneasters, so that the bushes retain their beauty much longer.

For previous introduction, see S. P. I. No. 47665.

53692. COTONEASTER ROTUNDIFOLIA Wall.

Received as *Cotoneaster prostrata*, for which *C. rotundifolia* is an earlier name.

53693. COTONEASTER SALICIFOLIA FLOCCOSA Rehd. and Wils.

A graceful, western Chinese shrub up to 13 feet high, which bears dense corymbs of white flowers and light-red, roundish fruits; native to altitudes of 7,500 to 9,800 feet.

For previous introduction, see S. P. I. No. 49666.

53694. COTONEASTER SALICIFOLIA RUGOSA (E. Pritz.) Rehd. and Wils.

"A very handsome Chinese shrub having long pendulous branches covered with much-wrinkled lanceolate leaves which have the under surface covered with down. The berries are small, globular, and bright scarlet. They are borne in clusters and, combined with the autumn tints of the foliage, produce a very pretty effect." (*Journal of the Royal Horticultural Society, vol. 38, p. cclii.*)

For previous introduction, see S. P. I. No. 40579.

53695. COTONEASTER SIMONSI Baker.

An ornamental Himalayan shrub 6 feet high. The bright-red berries are said to sometimes cover the shrub so thickly that it is scarcely possible to place one's finger between them.

For previous introduction, see S. P. I. No. 35128.

53696 to 53698. DEUTZIA spp. Hydrangeaceæ.

53696. DEUTZIA CORYMBOSA R. Br.

A pretty Himalayan species of late continuous flowering. It is at its best in July and August when the bush is covered with pure-white flowers. (Adapted from *Gardening Illustrated, vol. 39, p. 501.*)

For previous introduction, see S. P. I. No. 49939.

53697. DEUTZIA GLOBOSA Duthie.

This species, native to western Hupeh, China, bears dense globose panicles of medium-sized creamy white flowers with cup-shaped corollas. (Adapted from *The Gardeners' Chronicle, 3d ser., vol. 40, p. 248.*)

53698. DEUTZIA LONGIFOLIA VEITCHII (Veitch) Rehder.

This deutzia from Yunnan, China, bears its large flowers in dense, many-flowered corymbs. It is one of the handsomest of the deutzias, but has proved hardy only under protection at the Arnold Arboretum. (Adapted from *note by Alfred Rehder.*)

53627 to 53752—Continued.

53699 to 53702. EUONYMUS spp. Celastraceæ.

53699. EUONYMUS HAMILTONIANUS Wall.

A large Himalayan shrub, under favorable circumstances a moderate-sized tree, 30 to 35 feet high, with a short, straight trunk 4 to 5 feet in girth. The clusters of 15 to 30 greenish white flowers are followed by yellow capsules, the seeds of which are entirely surrounded by a scarlet aril. The fruit ripens from August onward. The leaves are brilliantly colored in fall; the wood is beautifully white, compact and close, not very hard, and is used for making spoons. The young shoots and leaves are lopped for fodder. (Adapted from *Brandis, Forest Flora of India, p. 78,* and *Arnold Arboretum Bulletin of Popular Information, No. 13, 1911.*)

53700. EUONYMUS LATIFOLIUS Mill.

A very decorative European shrub or small tree, with handsome foliage and rich rosy red pendulous fruits. The seed coat is orange colored.

53701. EUONYMUS PLANIPES Koehne.

A Japanese shrub or small tree with spreading branches; the leaves, 4 to 5 inches long, are rich red in autumn, and the red fruits burst when ripe and disclose the orange-colored seeds within.

For previous introduction, see S. P. I. No. 40179.

53702. EUONYMUS YEDOENSIS Koehne.

A deciduous Japanese shrub or small tree, growing 10 feet or more high, with pink fruits. The leaves turn a brilliant red in autumn.

For previous introduction, see S. P. I. No. 43688.

53703 to 53706. IRIS spp. Iridaceæ. Iris.

53703. IRIS BULLEYANA Dykes.

A fine western Chinese iris like *Iris clarkei*, with a hollow, unbranched stem. The narrow leaves are glossy above and glaucous beneath. The stem, 15 to 18 inches long, bears a single head of one or two flowers. The falls have a greenish yellow oblong haft, veined and dotted with purple. On the obovate blade the coloring becomes clearer and consists of broken veins and blotches of bright blue-purple on a creamy ground. The extremity is a uniform blue-purple, paler at the edges. The oblanceolate, channeled standards are pale blue-purple with deeper veins and diverge at an angle of about 60°. The keeled, dark-purple styles are held high above the falls. (Adapted from *Dykes, The Genus Iris, p. 30.*)

53704. IRIS CLARKEI Baker.

A curiously local species native to a circumscribed area in the Sikkim and Bhutan region at a height of 6,000 to 11,000 feet, in ground that is swampy half the year and frozen hard under snow during most of the remaining months. The narrow leaves, 2 feet long, droop at the top; the upper surface is polished and shiny, the under side glaucescent. The solid stem is 2 feet long, and bears one or two lateral heads. The falls are blue-purple, blotched with white, and are reflexed laterally. The upper part of the haft is marked with yellow. The reddish purple, lanceolate standards are poised almost horizontally. The styles form the highest point of the flower; they are keeled, very convex, and 1½ inches long. (Adapted from *Dykes, The Genus Iris, p. 29.*)

For previous introduction, see S. P. I. No. 49638.

53705. IRIS FORRESTII Dykes.

A most pleasing iris, like a dwarf *Iris wilsoni*, from which it differs in the less glaucous leaves, clearer yellow, unveined flowers, and upright and not spreading standards. The stems, 12 to 18 inches

53627 to 53752—Continued.

high, bear a single head of two flowers, although a lateral-flowered branch sometimes develops. The short haft bears two central lines and broken lateral veins of brown-purple on a clear-yellow ground. The oblong-ovate blade of the falls is often very long and drooping, of a clear, lemon-yellow color which becomes deeper around the end of the style branches and is there marked with brown-purple veins. The oblanceolate yellow blade of the standards narrows to a deeply channeled haft, yellow, shorter than the falls, and slightly divergent. The broad, short-keeled, deep-yellow styles, often discolored with purple, curve down on to the falls. Native to open mountain pastures on the eastern flank of the Likiang Range in northwestern Yunnan, China, at altitudes of 12,000 to 13,000 feet. (Adapted from *Dykes, The Genus Iris, p. 27.*)

53706. IRIS MELLITA Janka.

A Balkan dwarf iris, native to Thrace and northeastern Asia Minor, with thin swordlike leaves, occasionally tinged with red at the edge, and 3 to 5 inches long. The one-headed stem is from less than an inch to 5 inches high. The whole plant closely resembles *Iris pumila* except that it has that look of refinement which is characteristic of the Balkan as opposed to the Austrian and French dwarf irises. The greenish tube, 1½ to 2 inches long, is mottled with purple. The falls are shorter and broader than the standards, with the blade much reflexed and often pressed against the tube. The gray-white haft is veined with red-brown. The pale, smoky brown blade is veined with fine deep veins. About the end of the beard the texture is more velvety and the color a warm red-purple shot with electric blue. The conspicuous beard is composed of long, thickset hairs, white at the base and blue above. The standards are deeper in color than the falls and finely veined. At the base the veins give place to small dots and blotches. The narrow gray-white styles have a purple keel. (Adapted from *Dykes, The Genus Iris, p. 149.*)

53707 to 53716. LONICERA spp. Caprifoliaceæ. **Honeysuckle.**

53707. LONICERA ALPIGENA L.

A deciduous shrub, 4 to 8 feet high, native to central Europe. The yellow flowers, deeply tinged with red, are borne in pairs. The red, cherrylike fruit is half an inch long. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 39.*)

For previous introduction, see S. P. I. No. 49947.

53708. LONICERA DEFLEXICALYX Batal.

A beautiful deciduous shrub native to China and Tibet, showing its yellow flowers to good advantage by producing them on the upper side of the long, feathered branches. It grows 8 feet high and has horizontal or drooping branches and purple young shoots. The dull-green, downy leaves are grayish and hairy beneath, and the fruits are orange-red. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 41.*)

For previous introduction, see S. P. I. No. 40186.

53709. LONICERA DIOICA L.

A low-spreading ornamental shrub or vine with yellow flowers tinged with purple, and red berries; native to eastern North America.

53710. LONICERA LANCEOLATA Wall.

"A Himalayan species allied to *Lonicera orientalis*. The grayish green leaves, 2 to 4 inches long, are pubescent beneath, particularly on the veins. The fruits are black." (*Alfred Rehder.*)

53711. LONICERA LONGA Rehder.

An upright shrub with short branches appearing knotty on account of very short internodes and persistent bud scales. The dull-green

53627 to 53752—Continued.

leaves are grayish green and hairy veined beneath. The berries are purple. Native to Hupeh, China. (Adapted from *Rehder in Report of the Missouri Botanic Garden, vol. 14, p. 61.*)

53712. LONICERA MAACKII (Rupr.) Herd.

A bush honeysuckle, native to China and Manchuria, up to 10 feet high, with wide-spreading branches and dark-green leaves, downy on both surfaces; the pure-white flowers an inch in diameter turn yellowish with age and are produced in pairs on the upper side of the branchlets. The fruits are red.

For previous introduction, see S. P. I. No. 33435.

53713. LONICERA OBOVATA Royle.

"A Himalayan species, allied to *Lonicera tangutica*, with very small leaves, small yellowish white flowers, and bluish black fruits." (*Alfred Rehder.*)

53714. LONICERA QUINQUELOCULARIS TRANSLUCENS (Carr.) Zabel.

A sturdy bush, 10 feet high, that flowers freely, native to the Himalayas and China. The long-pointed leaves, rough on the upper surface, are grayish and downy beneath. The creamy white flowers changing to yellow are followed by translucent white fruits. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 54.*)

For previous introduction, see S. P. I. No. 40187.

53715. LONICERA RUPRECHTIANA Regel.

A Manchurian shrub 12 feet high, with dark-green leaves grayish pubescent beneath and pure-white flowers followed by red or yellow fruits.

For previous introduction, see S. P. I. No. 42317.

53716. LONICERA TRICHOSANTHA Bur. and Franch.

A robust deciduous shrub 8 feet high, native to Szechwan, China. The plant has a rounded, dense, leafy habit and a pale grayish aspect. The dull gray-green leaves are paler beneath, and the pale-yellow flowers fade to a deeper shade. The berries are red. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 59.*)

For previous introduction, see S. P. I. No. 43856.

53717. PERNETTYA MUCRONATA (L. f.) Gaud.

One of the finest ornamental berry-bearing shrubs, native to South America about the Straits of Magellan. It is one of the hardiest from that continent and is rarely severely injured by frost in the neighborhood of London. The shrub is evergreen, 2 to 5 feet high, and spreads freely by suckers, forming ultimately a dense, low thicket. The white, nodding flowers, one-fourth of an inch long, are produced singly in the axils of the leaves at the end of the shoots. The round berries, up to half an inch in diameter, vary in color from white to pink, lilac, crimson, purple, or almost black and remain on the branches through the winter and following spring. At Kew the berries are untouched by birds. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 127.*)

For previous introduction, see S. P. I. No. 36139.

53718 to 53726. PHILADELPHUS spp. Hydrangeaceæ. **Mock orange.**

53718. PHILADELPHUS ACUMINATUS Lange.

A shrub 10 feet high, native to Yunnan Province, China, and also Japan. The acuminate leaves have conspicuous hard-tipped teeth.

53627 to 53752—Continued.

Closely resembles *P. coronarius*, of which it is often considered a variety.

For previous introduction, see S. P. I. No. 49948.

53719. PHILADELPHUS BRACHYBOTRYS Koehne.

A shrub 10 feet high, native to Kiangsu, China, with thin, elliptic-pointed leaves and 5 to 7 flowered inflorescences up to 1½ inches long. The flowers are over half an inch in diameter, and the fruits are nearly globular. (Adapted from *Schneider, Handbuch der Laubholzkunde, vol. 1, p. 273.*)

53720. PHILADELPHUS INCANUS Koehne.

A late-flowering species up to 6 feet high with oval leaves dull grayish beneath and white, charmingly fragrant flowers with an odor like that of hawthorn. The flowers are produced five to nine together on racemes about 2 inches long at the end of short leafy shoots. The flowering season is from middle to late July. Native to Hupeh and Szechwan, China. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 135.*)

53721. PHILADELPHUS INODORUS L.

One of the finest and most striking species of the genus, distinguished by its dark glossy green leaves and solitary, squarish unscented flowers 2 inches across. The shrub is 4 to 6 feet high, and is native to the southeastern United States. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 136.*)

53722. PHILADELPHUS LATIFOLIUS Schrad.

One of the finest of the genus, a robust shrub 10 to 20 feet high, as much or more in diameter, native to the southeastern United States. The leaves are dull above and downy beneath, and the pure-white flowers nearly 2 inches wide are produced in the axils of the upper leaves of lateral twigs, usually seven or nine each. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 3, p. 137.*)

53723. PHILADELPHUS SATSUMI Siebold.

An erect Japanese shrub 6 to 8 feet high, with slightly scented white flowers about 1¼ inches across, produced in erect racemes.

53724. PHILADELPHUS SERICANTHUS Koehne.

A white-flowered shrub, 10 feet high; native to thickets of western Szechwan, China, at altitudes of 4,200 feet.

For previous introduction, see S. P. I. No. 52427.

53725. PHILADELPHUS SPECIOSISSIMUS Hort.

"A garden form, probably a hybrid of *Philadelphus grandiflorus*." (*Alfred Rehder.*)

53726. PHILADELPHUS WILSONII Koehne.

A shrub 7 to 20 feet high, native to western Szechwan and western Hupeh, China, with lax racemes 7 inches long. The white flowers are more than 1½ inches across. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 4.*)

53727 to 53730. RHODODENDRON spp. Ericaceæ. **Rhododendron.**

53727. RHODODENDRON BRACHYCARPUM D. Don.

A handsome hardy Japanese shrub with beautiful foliage and rather compact clusters of large pale-pink or pale straw-colored flowers. (Adapted from *Arnold Arboretum Bulletin of Popular Information, vol. 7, p. 27.*)

53627 to 53752—Continued.

53728. RHODODENDRON DAVIDSONIANUM Rehd. and Wils.

"A western Chinese shrub 10 feet high, with thinly coriaceous leaves glaucescent beneath and rosy pink, bell-shaped flowers 1 inch across." (*Alfred Rehder.*)

53729. RHODODENDRON DECORUM Franch.

"A western Chinese shrub with glabrous leaves glaucous beneath and broadly bell-shaped white or pink flowers 2 inches across." (*Alfred Rehder.*)

53730. RHODODENDRON RACEMOSUM Franch.

An evergreen shrub, 5 or 6 feet high, one of the most distinct and pretty of the dwarfer Chinese rhododendrons. The soft pink flowers, 1 inch across, widely bell shaped, are produced from the leaf axils of the previous year's wood. Often 6 to 12 inches of the shoot is laden with flowers. It is a charming plant for grouping in low shrubberies. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 374.*)

For previous introduction, see S. P. I. No. 52621.

53731 to 53743. ROSA spp. Rosaceæ. **Rose.**

53731. ROSA CINNAMOMEA L.
(*R. pendulina* L.)

Variety *pyrenaica.*

A graceful rose generally less than 2 feet high, said to be plentiful in the Pyrenees. The rosy red flowers, 2 to 3 inches in diameter, resemble in outline and form the dog-rose of England; the berries are also ornamental. The plant is well suited to rock gardens, but must not be allowed much root room, as it becomes too rampant. (Adapted from *The Garden, vol. 27, pp. 545, 560, and 587.*)

53732. ROSA DAVIDII Crepin.

A pink-flowered, orange-fruited rose, 3 to 18 feet high, native of western Szechwan, China, at altitudes of 4,000 to 9,000 feet. It is the species in China nearest to *Rosa macrophylla* of the western Himalayas. (Adapted from *Sargent, Plantae Wilsonianae, vol. 3, p. 322.*)

For previous introduction, see S. P. I. No. 43886.

53733. ROSA DAVIDII ELONGATA Rehd. and Wils.

A western Chinese form with leaflets 2 to 3 inches long, fewer flowers than in the species, and fruits about an inch long. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 5, p. 2997.*)

53734. ROSA LONGICUSPIS Bertol.
(*R. sinowilsoni* Hemsl.)

A rambling bush about 20 feet high, native to western China; with sparse, short prickles, large, dark-green leaves, and very large lax corymbs of white flowers which are up to 2 inches wide. (Adapted from *Kew Bulletin of Miscellaneous Information, 1906, p. 158.*)

For previous introduction, see S. P. I. No. 49683.

53735. ROSA MOLLIS Presl.

A compact Asiatic rose, often not more than 3 feet high, with usually pink, occasionally white, flowers and early ripening, red, pulpy fruits which are often pendulous and are very ornamental. (Adapted from *Willmott, The Genus Rosa, pl. 138.*)

For previous introduction, see S. P. I. No. 49952.

53627 to 53752—Continued.

53736. Rosa omeiensis Rolfe.

A shrub 6 to 18 feet high, with solitary, white, 4-petaled (rarely 5-petaled) flowers and scarlet fruits having fleshy orange-colored stalks. Abundant in upland thickets on the higher mountain ranges of western Hupeh and Szechwan, China. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 331.*)

For previous introduction, see S. P. I. No. 44400.

53737. Rosa omeiensis Rolfe.

Variety *atrosanguinea.*

A red-flowered variety.

53738. Rosa omeiensis pteracantha (Franch) Rehd. and Wils.

A shrub 2 to 9 feet tall with white flowers and red fruits having usually a shorter stalk than in the type. Very common on the wind-swept mountain sides of western Szechwan. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 332.*)

For previous introduction, see S. P. I. No. 48407.

53739. Rosa serafinii Viv.

A dwarf shrub with bright rose-colored, solitary flowers and small red fruits changing to black, native to the Mediterranean region. (Adapted from *Curtis's Botanical Magazine, pl. 7761.*)

For previous introduction, see S. P. I. No. 49953.

53740. Rosa sertata Rolfe.

A pretty rose 2 to 6 feet high, with small pink flowers and orange-red fruits; native to central China. (Adapted from *Sargent; Plantae Wilsonianae, vol. 2, p. 327.*)

For previous introduction, see S. P. I. No. 43912.

53741. Rosa webbiana Wall.

An Himalayan rose with glaucous young shoots with large white thorns, pink flowers, and red nodding fruits. (Adapted from *Willmott, The Genus Rosa, pl. 76.*)

53742. Rosa woodsii Lindl.

A shrub 3 feet high with leaves about an inch long and pubescent beneath, and corymbose or solitary pink, rarely white, flowers about 2 inches across. The flowering season is June to July. Native to North America from Saskatchewan to Colorado and Missouri. (Adapted from *Bailey, Standard Cyclopedia of Horticulture, vol. 5, p. 2993.*)

53743. Rosa sp.

Received as *Rosa polyphylla* for which a place of publication has not been found.

53744 to 53752. Viburnum spp. Caprifoliaceæ.

53744. Viburnum cotinifolium D. Don.

A species 6 to 12 feet high, closely allied to *Viburnum lantana,* native to the Himalayas from Bhotan to Beluchistan. The young branchlets, the under surface of the leaves, and the flower stalks are clothed with a dense, gray down. The white, pink-tinged, broadly funnel-shaped flowers are produced in rounded cymes 2 to 3 inches across. The red, ultimately black, fruits are up to half an inch long. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 645.*)

For previous introduction, see S. P. I. No. 33062.

53627 to 53752—Continued.

53745. VIBURNUM DILATATUM Thunb.

This profusely flowering shrub, 6 to 10 feet high, is native to Japan and China and produces pure-white flowers in cymes 3 to 5 inches across, not only at the top of the branch but from short twigs down the sides also. The bright-red fruits are one-third of an inch long. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 647.*)

For previous introduction, see S. P. I. No. 45974.

53746. VIBURNUM HUPEHENSE Rehder.

A species allied to *Viburnum wrightii*, native to central China and hardy at the Arnold Arboretum. The leaves are densely pubescent beneath, and the fruits are dark red. (Adapted from *Bailey, Standard Cyclopedia, vol. 6, p. 3463.*)

For previous introduction, see S. P. I. No. 44404.

53747. VIBURNUM ICHANGENSE (Hemsl.) Rehder.

A white-flowered, red-fruited shrub with yellowish green leaves; native to China. (Adapted from *Sargent, Trees and Shrubs, vol. 2, pt. 2, p. 105.*)

For previous introduction, see S. P. I. No. 43733.

53748. VIBURNUM LOBOPHYLLUM Graebn.

A shrub which belongs to the group of red-fruited Asiatic species containing *Viburnum wrightii, V. betulifolium, V. dilatatum*, etc. The white-flowered corymbs are 2 to 4 inches wide; and the bright-red, roundish fruits are one-third of an inch long. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 652.*)

For previous introduction, see S. P. I. No. 42198.

53749. VIBURNUM OVATIFOLIUM Rehder.

A species native to thickets of western Hupeh, China, at altitudes of 4,000 to 7,000 feet, with bright-red ovoid fruits. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 113.*)

53750. VIBURNUM RHYTIDOPHYLLUM Hemsl.

One of the most distinct and striking of the newer Chinese shrubs; it is an evergreen 10 feet high, and its flower clusters, 4 to 8 inches across, are formed and partially developed in autumn. The beauty of the shrub lies in its bold, wrinkled, shining leaves and red fruits which later become shining black. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 655.*)

For previous introduction, see S. P. I. No. 42199.

53751. VIBURNUM THEIFERUM Rehder.

A white-flowered, red-fruited shrub up to 12 feet high, native to central and western China, and allied to *Viburnum phlebotrichum*. The specific name refers to the use of the leaves by the monks of Mount Omei as a kind of tea. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 657.*)

53752. VIBURNUM VEITCHII C. H. Wright.

One of the most ornamental of the Lantana group, about 5 feet high, with young branches, leafstalks, and under surfaces of the leaves densely clothed with starlike down; the white flowers are in cymes 4 to 5 inches across, and the red fruits later become black. Native to central China. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 659.*)

For previous introduction, see S. P. I. No. 40599.

53753. SCLEROCARYA CAFFRA Sond. Anacardiaceæ.

From Mount Silinda, Southern Rhodesia, Africa. Seeds presented by Dr. W. L. Thompson. Received May 27, 1921.

"A tree not found in our forests, but common in the open forest country. It would seem probable that the fruit, improved by selection and breeding, ought to become quite valuable and attractive for the seed used as a nut, if not for the pulp, since the flavor of the kernel is pleasant, especially if slightly roasted. The shell is very hard and tough, but one can obtain the kernel without cracking it by prying off with a strong iron point the cap with which the shell is provided. If the kernel were larger and the cap could be removed more easily, it might be quite an attractive nut. As it is, the natives often crack the nuts and eat the kernels." (*Thompson.*)

For previous introduction, see S. P. I. No. 52216.

53754 to 53758.

From Quito, Ecuador. Collected by Wilson Popenoe, Agricultural Explorer of the Department of Agriculture. Received June 8, 1921. Quoted notes by Mr. Popenoe.

53754. CARICA CHRYSOPETALA Heilborn. Papayaceæ. **Higacho.**

"(No. 610a. Quito, Ecuador. May 7, 1921.) Seeds of *higacho* from Banos, Province of Tungurahua, where it is common in gardens. It does not appear to be grown in Ambato. In the Provinces of Pichincha and Imbabura it is called *chamburo* and is fairly abundant in the larger towns, such as Quito, Otavalo, and Ibarra. In the Azuay it is called *chamburao* and in Loja *toronchi;* in the former Province it is fairly abundant, but in the latter, with the exception of the northern portion, it appears to be little known.

"This plant resembles *C. candamarcensis* in general appearance, though it can readily be distinguished by its leaves which are glabrous or nearly so, while those of *C. candamarcensis* are pubescent below. The fruits of the *higacho* are also quite distinct; they are slender oblong, truncate at the base and acute at the apex, and commonly 4 to 6 inches long. When ripe they are greenish to deep yellow; the flesh is thin, even more aromatic than that of *C. candamarcensis*, and used only when cooked in the form of a sweet conserve or dulce. The species is probably indigenous to the Ecuadorian Andes."

For an illustration of fruits of the higacho, see Plate V.

53755. CRATAEGUS STIPULOSA (H. K. B.) Steud. Malaceæ.

"(No. 604. Quito, Ecuador. May 7, 1921.) Plants of *Huagra-manzana* or *manzana silvestre*, from the Protestant cemetery in Quito. This plant, which grows wild along some of the ravines in the vicinity of Quito and is occasionally seen in cultivation, becomes a slender tree 20 to 25 feet high. It has elliptic-lanceolate, serrate leaves and produces during March, April, and May round yellow fruits about an inch in diameter. These are almost identical with *tejocotes* of Mexico and the *manzanilla* of Guatemala; the flesh is whitish, mealy, and rather dry, of pleasant flavor suggesting that of the apple. The seeds are larger and rough. During the ripening season the fruits are commonly sold in the markets of Quito.

"For trial in the United States as a stock plant for other rosaceous fruits; as a fruit-bearing species it is less valuable than some of its Central American congeners."

53756. ONOSERIS SALICIFOLIA H. B. K. Asteraceæ.

"(No. 605a. Loja, Ecuador, May 7, 1921.) Seeds of a half-shrubby composite which grows in the region of Loja and also in other parts of southern Ecuador at altitudes of 7,000 to 8,000 feet. It is 5 feet high and produces an abundance of lavender-blue flowers about 2 inches in diameter. It is a pretty perennial, worthy of trial in the United States as an ornamental plant."



THE HIGACHO, AN ANDEAN RELATIVE OF THE PAPAYA. (CARICA SP.; S. P. I. No. 53754.)

In the high Andes of Ecuador are found several wild species of Carica, similar in general appearance to the papaya but much more frost resistant. The Higacho is one of these. It withstands without injury temperatures as low as 20° F. above zero, and its greenish yellow fruits, about 4 inches long and highly aromatic in character, when cooked with sugar, make an excellent preserve. The species should be crossed with the papaya with a view to obtaining new forms of value for cultivation in California and Florida. (Photographed by Wilson Popenoe, Banos, Ecuador, March 11, 1921; P18484FS.)



AKALA, A GIANT HAWAIIAN RASPBERRY. (RUBUS MACRAEI A. GRAY; S. P. I. No. 53847.)

Recent investigations have brought to light several species of Rubus which promise to prove of value to plant breeders. One of the most striking of these is the Akala of Hawaii, whose fruits sometimes attain 2 inches in diameter. It is not sufficiently hardy to be cultivated in the Temperate Zone, but through crossing with northern raspberries may give rise to new forms of great value for the southern United States. (Photographed by J. F. Rock, Honolulu, Hawaii, May, 1921; 22895D–FS.)

53754 to 53758—Continued.

53757. SALVIA SQUALENS H. B. K. Menthaceæ. **Sage.**

"(No. 606a. Loja, Ecuador, May 7, 1921.) Seeds of a handsome species collected near Loja, in southern Ecuador. The plants, which grow commonly on dry and rocky slopes, produce spikes of tubular flowers varying in color from a beautiful salmon pink or coral pink to bright scarlet. Should be tested in the United States as an annual."

53758. SENECIO PIMPINELLAEFOLIUS H. B. K. Asteraceæ.

"(No. 607a. Loja, Ecuador, May 7, 1921.) Seeds of a pretty composite, collected in the mountains south of Loja, where it grows at altitudes of 6,000 to 8,000 feet. The plant is acaulescent, forming a rosette of leaves which lie close to the ground; the flowers, which are produced on stems rising 10 to 20 inches long, are a burnt-orange color and very attractive. The general character of the plant suggests the Transvaal daisy (*Gerbera jamesoni*)."

53759 and 53760. RUBUS MACRAEI A. Gray. Rosaceæ. **Akala.**

From Mauna Kea, Hawaii. Collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received June 7, 1921. Quoted notes by Mr. Rock.

53759. "Cuttings of a beautiful orange-green variety of the Hawaiian giant raspberry, from an altitude of 6,000 feet on Mauna Kea, Hawaii, May 13, 1921."

53760. "Roots of a reddish black to purple variety of the Hawaiian giant raspberry, from an altitude of 6,000 on Mauna Kea, Hawaii, May 13, 1921."

53761. CARICA PAPAYA L. Papayaceæ. **Papaya.**

From Swatow, China. Seeds presented by A. H. Page. Received June 21, 1921.

"Seeds of a brown-seeded papaya. All our other varieties have gray and black seeds." (*Page.*)

53762 to 53842.

From the city of Guatemala. Seeds presented by Sr. Ad. Tonduz, Dirección General de Agricultura. Received June 20, 1921. Quoted notes by Sr. Tonduz.

53762. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

"*No. 1.* From Municipio de Jocotenango, Huehuetenango."

53763. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

"*No. 2.* From Santo Tomas Chichicastenango, Quiche."

53764 to 53778. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53764. "*No. 6b.* From San Miguel, Quiche."

53765. "*No. 4.* From San Antonio S., San Marcos."

53766. "*No. 5. Frijol negro.* From Santa Catarina B., Sacatepequez."

53767. "*No. 6b.* From San Miguel, Quiche."

53768. "*No. 6a.* From San Pedro las H., Sacatepequez."

53769. "*No. 6c.* From San Pedro La Laguna, Solola."

53770. "*No. 7. Frijol negro enrededor.* From Barillas, Huehuetenango."

53771. "*No. 8a. Frijol negro enrededor nebaj.* From Quiche."

53772. "*No. 8b.* From San Sebastian, Huehuetenango."

53773. "*No. 10. Frijol negro enrededor.* From Chimaltenango."

53762 to 53842—Continued.

53774. "*No. 12. Frijol negro de suelo.* From San Andres C., Sacatepequez."

53775. "*No. 13. Frijol negro de vara.* From San Rafael, San Marcos."

53776. "*No. 14. Frijol negro de vara.* From Sipacapa, San Marcos."

53777. "*No. 17. Frijol negro mateado.* From Aguacatan."

53778. "*No. 15. Frijol negro colas enrededor.* From Patzum, Chimaltenango."

53779. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

"*No. 18. Frijol chamborote negro oscuro enredador.* From Santa Isabel, Huehuetenango."

53780. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

"*No. 20. Frijol negro ishtapacal.* From Nuevo Progreso, San Marcos."

53781 to 53787. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53781. "*No. 21a. Frijol colorado.* From San Andres C., Sacatepequez."

53782. "*No. 22.* Chimaltenango, Chimaltenango."

53783. "*No. 23. Frijol negro de milpa.* From San Martin, Chimaltenango."

53784. "*No. 24. Frijol negro pequeño mata.* From Cuilapa, Santa Rosa."

53785. "*No. 25. Frijol negro pequeño.* From Japalmico, San Marcos."

53786. "*No. 26. Cuarenteno negro.* From Ciudad Vieja, Sacatepequez."

53787. "*No. 27. Frijol negro cuarenteno.* From San Pedro la Laguna, Solola."

53788. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

"*No. 28. Frijol negro chamborote.* It bears prolifically. From San Juan Acatan, Huehuetenango."

53789. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

"*No. 29. Frijol negro de mata.* From Barillas, Huehuetenango."

53790. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

"*No. 30. Frijol negro grande.* From Tajumulco, San Marcos."

53791 to 53795. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53791. "*No. 31. Frijol negro.* From Vaina Morada, Chimaltenango, Chimaltenango."

53792. "*No. 32. Frijol de sarco.* From Zacualpa, Quiche."

53793. "*No. 33a. Frijol negro.* From San Martin, Chimaltenango."

53794. "*No. 33b.* From Huehuetenango."

53795. "*No. 35. Frijol de riego mateado.* From Aguacatan, Huehuetenango."

53796 to 53799. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

53796. "*No. 37.* From San Pedro, Huehuetenango."

53797. "*No. 38a. Frijol amarillo anaranjado Llamado Tsiche enrededor.* From Santa Isabel, Huehuetenango."

53798. "*No. 38b. Frijol ixich ojolenam.* From San Marcos."

53799. "*No. 38c.* From Municipio de Aguacatan, Huehuetenango."

53762 to 53842—Continued.

53800. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

"*No. 40. Frijol amarillo.* From San Lucas, Sacatepequez."

53801 to 53803. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

53801. "*No. 41a. Frijol amarillo.* From San Juan A., Huehuetenango."

53802. "*No. 42a.* From San Sebastian, Huehuetenango."

53803. "*No. 42b. Frijol amarillo.* From Ixtapacal, San Rafael, San Marcos."

53804 and 53805. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53804. "*No. 43. Frijol amarillo de milpa.* From San Martin, Chimaltenango."

53805. "*No. 45.* From Chimaltenango."

53806. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

"*No. 46. Frijol pilique colorado.* From San Lorenzo el Cubo, Sacatepequez."

53807 and 53808. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53807. "*No. 47a. Frijol pilique colorado.* From Senacoj, Sacatepequez."

53808. "*No. 47b.* From Aguacatan, Huehuetenango."

53809 to 53812. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

53809. "*No. 48. Frijol pilique colorado enrededor.* From Comalapa, Chimaltenango."

53810. "*No. 49b. Frijol pilique blanco.* From Patzum, Chimaltenango."

53811. "*No. 49a.* From San Juan Acatan, Huehuetenango."

53812. "*No. 50.* From San Lorenzo, Sacatepequez."

53813. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

"*No. 51. Frijol tripa de gallina.* From Nuevo Progreso, San Marcos."

53814 to 53817. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53814. "*No. 52. Frijol gato enredador.* From Patzum, Chimaltenango."

53815. "*No. 53.* From San Sebastian, Huehuetenango."

53816. "*No. 54a. Frijol Kinak-Shak.* From Santiago, Sacatepequez."

53817. "*No. 54b.* From Colotenango, Huehuetenango."

53818 and 53819. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

53818. "*No. 55. Pilique morado enrededor.* From Patzum, Chimaltenango."

53819. "*No. 56. Giloy pintillo.* From Santa Maria Dej, Sacatepequez."

53820 to 53823. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53820. "*No. 57. Frijol varitas.* From San Antonio A. C., Sacatepequez."

53821. "*No. 58. Frijol riñon.* From Duenas, Sacatepequez."

53822. "*No. 59. Pinto negro sotero.* From Acatenango, Chimaltenango."

53823. "*No. 60. Pintillo.* From Pastores, Sacatepequez."

53762 to 53842—Continued.

53824. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

"*No. 61. Frijol Escumite.* From Nuevo Progreso, San Marcos."

53825 to 53834. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53825. "*No. 62. Frijol sardo.* From San Mateo Ma, Sacatepequez."

53826. "*No. 63. Frijol pinto.* From San Lucas, Sacatepequez."

53827. "*No. 64.* From Chimaltenango."

53828. "*No. 65. Frijol retinto del suelo.* From Jutiapa."

53829. "*No. 66. Frijol pinto oscuro.* From Quezaltenango."

53830. "*No. 67. Frijol pinto enrededor.* From Chiantla."

53831. "*No. 68. Frijol pinto de vara.* From Nuevo Progreso, San Marcos."

53832. "*No. 69. Pinto Lengua de vaca.* From San Martin J., Chimaltenango."

53833. "*No. 70. Frijol pinto.* From Quezaltenango."

53834. "*No. 71. Frijol pinto.* From San Mateo Ma, Sacatepequez."

53835. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

"No. 72. *Frijol yurnas.* From Jutiapa."

53836. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

"No. 73. *Frijol morado excapacal.* From San Antonio S., San Marcos."

53837 to 53840. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53837. "*No. 74. Frijol rosado enrededor.* From Jutiapa."

53838. "*No. 75. Frijol ixcaco enrededor.* From Parramos, Chimaltenango."

53839. "*No. 76. Frijol color de café.* From Quezaltenango."

53840. "*No. 77. Frijol peruano de suelo.* From Parramos, Chimaltenango."

53841. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

Mixed (spilled) brown, black, reddish, etc., beans.

53842. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

Mixed (mostly white).

53843. IPOMOEA sp. Convolvulaceæ. **Morning-glory.**

From Calcutta, India. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received June 1, 1921.

"A beautiful morning-glory cultivated in the Botanic Garden at Sibpur, Calcutta. It is a strong climber and is said to have red flowers. Collected in March, 1921." (*Rock.*)

53844. TARAKTOGENOS KURZII King. Flacourtiaceæ. **Chaulmoogra tree.**

From Burma, India. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received June 8, 1921.

"True chaulmoogra from the upper Chindwin River." (*Rock.*)

For previous introduction, see S. P. I. No. 43227.

53845. SALVADORA PERSICA L. Salvadoraceæ.

From Khartum, Sudan, Africa. Seeds presented by R. E. Massey, Government botanist. Received June 27, 1921.

A shrub or small tree easily reproduced from seed, though of slow growth, common on the shores of Lake Chad and growing in dense clumps from 3 to 10 feet high near Shibam, Hadramaut, etc. The twigs are used as a tooth cleanser by the natives of Portuguese East Africa. The wood is white and soft and weighs about 45 pounds per cubic foot. The shoots and leaves are pungent. They are eaten as salad and given as fodder to camels; the fruits, bitter, pungent, and aromatic, are used with the leaves and shoots as a relish. The root bark is acrid and vesicant. The seed contains about 45 per cent of fat, suitable for the manufacture of candles. A vegetable salt called *kegr* is obtained from the ash of this plant in northern Nigeria. The seed cake is useful as a manure; analysis shows that it contains nitrogen 4.8 per cent, potash 2.8 per cent, and phosphoric acid 1 per cent. (Adapted from *Holland, Useful Plants of Nigeria, pt. 3, p. 427.*)

For previous introduction, see S. P. I. No. 7362.

53846. SOLANUM COMMERSONII Dunal. Solanaceæ. **Wild potato.**

From Montevideo, Uruguay. Tubers presented by Sr. Luis Guillot, Dirección General de Paseos Públicos. Received June 28, 1921.

"A Solanum with angled stems and leaves 4 to 8 inches long with two to four pairs of leaflets, the terminal one somewhat larger. The corolla is white or pale violet, pubescent on the outer surface. Native to eastern Argentina and Uruguay, usually in moist situations." (*W. F. Wight.*)

For discussion of experiments with this species in France, see Labergerie, Une Nouvelle Pomme de Terre (Solanum commersonii), Revue Horticole, vol. 78, p. 303).

For previous introduction, see S. P. I. No. 17054.

53847. RUBUS MACRAEI A. Gray. Rosaceæ. **Akala.**

From Mauna Kea, Hawaii. Cuttings collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received June 7, 1921.

"The Hawaiian giant raspberry, reddish black to purple variety, from an altitude of 4,500 feet, on the Shipman Ranch, Mauna Loa, Hawaii, May 13, 1921." (*Rock.*)

For introduction of roots, see S. P. I. No. 53760.

For an illustration of the fruit of this raspberry, see Plate VI.

53848. HYPHAENE THEBAICA (L.) Mart. Phœnicaceæ. **Doum palm.**

Received through the United States Department of State, June 24, 1921.

A palm 25 feet high, distributed from Upper Egypt to central Africa. The stems of old trees are sometimes forked three or four times. The yellowish brown, beautifully colored fruits are borne in long clusters of one to two hundred. In Upper Egypt the poorer classes eat the fibrous, mealy fruit husk, which tastes much like gingerbread, but is rather hard and husky. The hard tough wood is used for domestic utensils. (Adapted from *Lindley and Moore, Treasury of Botany, vol. 2, p. 612.*)

For previous introduction, see S. P. I. No. 51440.

53849. PINUS MASSONIANA Lambert. Pinaceæ. **Pine.**

From Hongkong, China. Seeds collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received June 1, 1921.

"The Hongkong pine, the most common tree of the island of Hongkong, growing well on sandy soil and much planted to check erosion. It is a rare pine and sparingly cultivated in America. Suited for northern Florida. Collected April, 1921." (*Rock.*)

For previous introduction, see S. P. I. No. 34548.

53850. Lecythis zabucajo Aubl. Lecythidaceæ. Sapucaia nut.

From Port of Spain, Trinidad. Seeds presented by Eugene André. Received June 30, 1921.

A large tree attaining a height of 80 or more feet and expanding into large heads of glossy foliage. The seeds, known as sapucaia nuts, are greatly superior in flavor to the closely allied Brazil nut (*Bertholletia nobilis*) and much easier to digest. They are rather more than 2 inches long and 1 inch wide, covered with a longitudinally furrowed corky shell, and grow in large, hard, woody fruits shaped like urns which measure 6 inches across and have close-fitting lids. Native to tropical America and Africa. (Adapted from *Lindley, Treasury of Botany, p. 667.*)

53851 and 53852.

From Melbourne, Victoria, Australia. Seeds presented by F. H. Baker. Received June 29, 1921.

53851. Cassia laevigata Willd. Cæsalpiniaceæ.

An erect glabrous shrub several feet in height. The yellow flowers, with petals from one-half to three-quarters of an inch broad, are in axillary and terminal racemes. The leathery pods are 2 to 3 inches long, cylindrical or more or less inflated when ripe. Native to Queensland and New South Wales. (Adapted from *Bentham, Flora Australiensis, vol. 2, p. 282.*)

53852. Eucalyptus risdoni Hook. f. Myrtaceæ.

An ornamental glaucous-leaved tree 20 to 50 feet high, with somewhat pendulous branches, smooth flaky bark, and with buds, flowers, and fruits similar to those of *Eucalyptus amygdalina*, but slightly larger.

For previous introduction, see S. P. I. No. 51064.

53853 to 53855. Fragaria spp. Rosaceæ. Strawberry.

From Bedford, England. Plants presented by Laxton Bros. Received March 15, 1921. Numbered June 30, 1921.

53853. Fragaria sp.

Laxtonian strawberry. A vigorous midseason variety said to produce bold clusters of large fruits 2½ inches across, the center ones wedge shaped, having very firm, rich glossy crimson flesh which retains its color well. The flavor is reported excellent, and the secondary fruits are said to be very even in size, making the variety a continuous cropper not running very small, as some varieties do in the third picking.

53854. Fragaria sp.

Royal Sovereign. Reported as a careful reselection from the strongest and most vigorous stock of the best early varieties for forcing and outdoor use.

53855. Fragaria sp.

Received without description.

53856 to 53894.

From the city of Guatemala, Guatemala. Seeds presented by Sr. Ad. Tonduz, Dirección General de Agricultura. Received June 29, 1921. Quoted notes by Sr. Tonduz.

53856. Cajan indicum Spreng. Fabaceæ. Pigeon-pea.

"*No. 96.* From Nuevo Progreso, San Marcos."

53857. Capsicum annuum L. Solanaceæ. Red pepper.

"*No. 105.* From Asuncion Mixa, Jutiapa."

53858. Cicer arietinum L. Fabaceæ. Chick-pea.

"*No. 99.* From San Pedro La Laguna, Solola."

53856 to 53894—Continued.

53859. DOLICHOS LABLAB L. Fabaceæ. **Bonavist bean.**

"*No. 95.* Frijol alverjón. From San Rafael, San Marcos."

53860. LINUM USITATISSIMUM L. Linaceæ. **Flax.**

"*No. 109.* Linaza. From Santa Lucia, Sololá."

53861 and 53862. ORYZA SATIVA L. Poaceæ. **Rice.**

53861. "*No. 106a. Arroz en granza.* From Tecuaco, Chiquimulilla, Santa Rosa."

53862. "*No. 106b. Arroz en granza.* From Chiquimulilla, Santa Rosa."

53863. PISUM SATIVUM L. Fabaceæ. **Garden pea.**

"*No. 97.* From Santa Cruz Balanaja, Chimaltenango."

53864. SESAMUM ORIENTALE L. Pedaliaceæ.

"*No. 104. Ajonjolí.* From Chiquimulilla, San Marcos."

53865. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.**
(*T. vulgare* Vill.)

"*No. 107a.* From San Miguel, Acatan."

53866. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

"*Frijol colorado pirrunchin.* From Jutiapa."

53867. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

"*No. 78. Frijol piloy colorado.* From Ciudad Vieja, Sacatepequez."

53868. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

"*No. 79. Frijol blanco ishtapacal.* From Nuevo Progreso, San Marcos."

53869 to 53872. PHASEOLUS COCCINEUS L. Fabaceæ.
Scarlet Runner bean.

53869. "*No. 80. Frijol piloy.* From Duenas, Sacatepequez."

53870. "*No. 81. Frijol piloy.* From Parramos, Chimaltenango."

53871. "*No. 82. Frijol piloy colorado.* From Pastores, Sacatepequez."

53872. "*No. 83. Frijol piloy.* From Xenacoj, Sacatepequez."

53873 to 53878. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53873. "*No. 84. Pequeño café.* From Tajumulco, San Marcos."

53874. "*No. 85a. Frijol blanco de vara.* From Santa Maria de J., Sacatepequez."

53875. "*No. 85b. Frijol blanco de vara.* From San Rafael, Marcos."

53876. "*No. 85c. Frijol blanco de suelo.* From Camalapa, Chimaltenango."

53877. "*No. 86a.* From San Pedro La Laguna, Sololá."

53878. "*No. 86b.* From San Pedro La Laguna, Sololá."

53879. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

"*No. 87. Frijol blanco grande.* From San Antonio, San Marcos."

53880 to 53890. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53880. "*No. 88. Frijol blanco.* From San Mateo, Sacatepequez."

53881. "*No. 89a.* From Magdalena, Sacatepequez."

53882. "*No. 89b.* From Acatenango, Chimaltenango."

53883. "*No. 90a. Frijol blanco enredador.* From Chimaltenango."

53884. "*No. 90b.* From Zaragoza, Chimaltenango."

53885. "*No. 90c.* From Itzapa, Chimaltenango."

53856 to 53894—Continued.

53886. "*No. 90d. Frijol blanco lacandor.* From Parramos, Chimaltenango."

53887. "*No. 91. Frijol colima.* From San Rafael, San Marcos."

53888. "*No. 92. Frijol colorado camalapa enredador.* From Chimaltenango."

53889. "*No. 93. Frijol blanco de enredo.* From La Candelaria, Barillas, Huehuetenango."

53890. "*No. 94.* From San Antonio S., San Marcos."

53891. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

"*No. 103. Frijol colorado ixtapacal.* From Nuevo Progreso, San Marcos."

53892 and 53893. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

53892. "*No. 104. Frijol colorado de gancho de suelo,* Chimaltenango."

53893. "*No. 100.* From Quezaltenango."

53894. PHASEOLUS COCCINEUS L. Fabaceæ. **Scarlet Runner bean.**

"*No. 101.* From San Lorenzo, Sacatepequez."

53895. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**

(*P. gratissima* Gaertn. f.)

From Ibarra, Ecuador. Cuttings collected by Wilson Popenoe, Agricultural Explorer of the Department of Agriculture. Received June 24, 1921.

"(No 619. Hacienda Carpuela, May 26, 1921. Avocado No. 54.) *Capac.* The parent tree is growing in the huerta rented by Rosa Gonzales, at the Hacienda Carpuela, at an altitude of 5,300 feet. The fruit is a good-sized Mexican avocado about 9 ounces in weight, obovoid in form, purple, and of excellent quality. The seed is relatively small, and the tree is said to be very productive. The variety is worth a trial in California, and in the cooler avocado-growing regions of Florida.

"Formal description: The parent tree is about 45 feet high, slender and erect in habit, with a trunk 18 inches thick at the base, forked 2 feet above the ground. The oval crown is moderately dense and the foliage rich green and healthy in appearance.

"The fruit is oblong pyriform to oval obovoid, weight about 9 ounces, length 4 to 4½ inches, greatest breadth about 2¾ inches; base broadly pointed, the stem inserted slightly to one side; apex rounded to slightly and obliquely flattened; surface of ripe fruit glossy purple black, with very few dots visible; skin less than 0.5 millimeter thick, relatively tough; flesh yellowish cream color, tinged green near the skin, with numerous fiber markings; flavor nutty, rich, and pleasant; quality good; seed rather small, ovate to oval, tight in the cavity with both seed coats adhering closely to the cotyledons. Ripening season mainly from November to March, but a few fruits ripen at other seasons of the year.

"Some specimens do not show any fiber discoloration in the flesh; this is perhaps a question that depends, to a certain extent, upon the degree of maturity which the fruit has reached at the time it is picked."

CORRECTION.

Inventory 64, page 45, third line from bottom, for line that reads—

51036. PLACUS BALSAMIFIER (L.) Bail. Asteraceæ.

substitute as follows:

51037. INULA ROYLEANA DC. Asteraceæ.

INDEX OF COMMON AND SCIENTIFIC NAMES.

Acacia caesia, 53563.
leucophloea, 53564.
Acanthopanax setuenensis, 52928.
Aconite, winter, *Eranthis hyemalis*, 53053, 53145.
Aconitum lycoctonum, 52870. 53081, 53122.
napellus, 53082.
paniculatum, 53083.
septentrionale, 53123.
Acrocomia sclerocarpa, 53487.
Adhatoda vasica. See *Justicia adhatoda*.
Aegilops triticoides. See *Triticum aestivum* × *ovatum*, 53079.
Agropyron sp., 52871.
caninum, 53084.
elongatum, 53085.
obtusiusculum, 53031.
rigidum. See *A. elongatum*.
violaceum, 53124.
Agrostis borealis, 53125.
Aira caespitosa, 52872.
flexuosa, 52873.
Akala, *Rubus macraei*, 53480–53482, 53625, 53759, 53760, 53847.
Albizzia lophantha, 52895.
Aleurites moluccana, 53547.
Alfalfa, *Medicago sativa*, 53448.
Alkanet, rose, *Nonnea rosea*, 52883, 53062, 53107, 53154.
yellow, *Alkanna lutea*, 53032, 53126.
Alkanna lutea, 53032, 53126.
Allium cepa, 52913.
Alopecurus pratensis, 53465.
Alphitonia excelsa, 52896.
Amygdalus persica, 52898.
Annona cherimola, 53594.
Anogeissus latifolia, 53565.
sericea, 53566.
Antirrhinum orontium, 53086, 53127.
Apple, *Malus sylvestris*, 53381–53401.
Laos, *M. laosensis*, 52900.
Paradise, *M. pumila*, 53380.
Tonking, *M. doumeri*, 53008.
Apricot, *Prunus armeniaca*, 52914.
Aquilegia atrata, 53128.
fragrans, 53087.
viridiflora, 53129.
Aralia chinensis glabrescens, 52929.
Araticuy, *Rollinia emarginata*, 53616.
Aristolochia acuminata, 53612.
Arrhenatherum arenaceum. See *A. elatius*.
elatius, 53088.
Aster novi-belgii, 53009–53029.
vimineus, 53030.
Atriplex hortensis, 52893.
Avena barbata wiestii, 53626.
montana, 53130.
nuda, 53131.
sativa, 53624.
sterilis, 53132.
strigosa, 53133.
Avocado, *Persea americana*, 53182–53185, 53895.
Axonopus, sp., 52917.

Balsa, *Ochroma lagopus*, 53262, 53490.
Bamboo, *Dendrocalamus strictus*, 53610.
Banana, *Musa* sp., 53119.
Baptisia australis, 53033.
Barberry, *Berberis* spp., 52874–52877, 52930–52932, 53034, 53035, 53089, 53090, 53177, 53627–53649.
Barley, *Hordeum* spp., 53057, 53102–53105, 53147, 53239.
Bauhinia vahlii, 53567.
variegata, 53568.
Bean, bonavist, *Dolichos lablab*, 53045, 53533, 53859.
common. See *Phascolus vulgaris*.
Lima. See *Phaseolus lunatus*.
rice, *Phaseolus calcaratus*, 52857.
Scarlet Runner. See *Phaseolus coccineus*.
Berberis spp., 52932, 53648, 53649.
aggregata, 53627.
prattii, 53639.
aristata, 53034, 53628.
atrocarpa, 53629.
chinensis, 52874, 52875, 53630.
crataegina, 53089.
darwinii, 53631.
dictyophylla, 53632.
edgeworthiana, 52930.
francisci-ferdinandi, 52931, 53633.
gagnepaini, 53634.
guimpeli, 52876.
hookeri, 53090, 53635.
integerrima, 52877.
lycium, 53035, 53636.
orthobotrys, 53637.
polyantha, 53638.
quinduensis, 53177.
stapfiana, 53640.
subcaulialata, 53641.
thibetica, 53642.
thunbergii, 53643.
tischleri, 53644.
umbellata, 53645.
veitchii, 53646.
wallichiana. See *B. hookeri*.
wilsonae, 53647.
Betula medwediewi, 52933.
Birch, *Betula medwediewi*, 52933.

Blackberry, *Rubus* sp., 53545.
Bor, *Ziziphus mauritiana*, 52858.
Borago officinalis, 53091.
Boswellia serrata, 53569.
Brachiaria plantaginea, 52918.
Brachypodium sylvaticum, 53134.
Bramble, *Rubus* spp., 52939, 53535–53540.
Brassica pekinensis, 52910.
rugosa, 53542.
Breadnut tree, *Brosimum alicastrum*, 53534.
Bromus adoensis, 53036.
brizaeformis, 53135.
laciniatus, 53037.
racemosus, 53038.
rigidus, 53092.
unioloides, 53557.
Brosimum alicastrum, 53534.

Cajan indicum, 53238, 53856.
Calamagrostis coarctata, 52955.
Calamus sp., 52902.
Canavali sp., 52855.
plagiosperma, 52861.
Capriola spp., 52903, 52904.
Capsicum annuum, 53857.
Carica chrysopetala, 53754.
papaya, 53761.
Caryota sp., 53120.
Casimiroa sp., 53496.
edulis, 53491.
Cassia fistula, 53570, 53613.
laevigata, 53851.
Castor-bean, *Ricinus communis*, 52953, 52954, 53242.
Catalpa bungei, 52909.
Catjang, *Vigna cylindrica*, 53080.
Cerinthe alpina, 53093, 53136.
major, 53039, 53094.
minor, 53095.
Chaulmoogra tree, *Taraktogenos kurzii*, 53844.
false, *Gynocardia odorata*, 53121.
Cherimoya, *Annona cherimola*, 53594.
Cherry, mahaleb, *Prunus mahaleb*, 53415.
Prunus spp., 53416–53426, 53442.
Chick-pea, *Cicer arietinum*, 53858.
Chufa, *Cyperus esculentus*, 52899.
Chuquiraga insignis, 53179.
Cicer arietinum, 53858.
Citrus decumana. See *C. grandis*.
grandis, 53611.
Clematis spp., 53663–53665.
aethusifolia latisecta, 53650.
alpina, 53137.
sibirica, 53138.
flammula, 53139.
fusca, 53651.
glauca akebioides, 53652.
grata, 53653.
grandidentata, 53654.
gravcolens, 53040.
integrifolia, 53140.
intermedia, 53655.
montana rubens, 52934.
Clematis pseudoflammula, 53141, 53656.
recta, 53657.
reticulata, 53041.
spooneri, 53658
tangutica, 53659.
veitchiana, 53660.
vitalba, 53042, 53661.
viticella, 53043, 53096, 53662.
Clerodendrum infortunatum, 53571.
Clover, cluster, *Trifolium glomeratum*, 53007, 53541.
red, *Trifolium pratense*, 53552–53554.
white, *Trifolium repens*, 53449, 53450.
sweet, *Melilotus alba*, 52916, 53621.
Clusia sp., 53489.
Cochlospermum gossypium. See *Maximiliana gossypium*.
Coconut, *Cocos nucifera*, 53497–53499.
Cocos nucifera, 53497–53499.
Coffea canephora, 53454, 53455.
canephora kouilouensis, 53459.
congensis, 53456.
dewevrei, 53457.
excelsa, 53458.
laurentii, 53461, 53462.
liberica, 53460.
robusta. See *C. laurentii*.
Coffee, *Coffea* spp., 53454–53462.
Columbine, *Aquilegia*, spp., 53087, 53128, 53129.
Colutea media, 52878.
orientalis, 52879.
Comfrey, *Symphytum* spp., 52885, 53109, 53161.
Corchorus olitorius, 52890–52892.
Corn, *Zea mays*, 52911, 53217, 53595–53606.
Coronilla varia, 53607.
Cotoneaster acutifolia, 53666.
acutifolia villosula, 52935.
affinis, 53468, 53667.
bacillaris, 53668.
obtusa, 53669.
amoena, 53670.
apiculata, 53671.
bacillaris. See *C. affinis bacillaris*.
bullata, 53672.
buxifolia, 53673.
dielsiana, 53674.
divaricata, 53675.
franchetii, 53676.
frigida, 53677, 53678.
harroviana, 53679.
hebephylla, 53680.
henryana, 53681.
horizontalis, 53682.
lindleyi, 53683.
lucida, 53684.
melanocarpa laxiflora, 53685.
microphylla, 53686.
thymifolia, 53687.
moupinensis, 53688.
pannosa, 53689.

Cotoneaster racemiflora, 53690.
rotundifolia, 53691, 53692.
salicifolia floccosa, 53693.
rugosa, 53694.
simonsi, 53469, 53695.
Cotton, *Gossypium* spp., 53263–53266, 53492, 53493.
Cowpea, *Vigna sinensis*, 52862, 53813, 53824, 53866.
Crataegus stipulosa, 53755.
Crowfoot, *Ranunculus* spp., 53108, 53158.
Cucumber, *Cucumis sativus*, 52868, 52869, 53267, 53268, 53451.
Cucumis sativus, 52868, 52869, 53267, 53268, 53451.
Currant, garden, *Ribes vulgare*, 53220–53237.
Cyperus esculentus, 52899.

Danthonia setacea, 53115.
Davidia involucrata vilmoriniana, 52936.
Delphinium amoenum, 53097.
cashmerianum, 53098, 53142.
consolida, 53044.
elatum, 53099, 53143.
Dendrocalamus strictus, 53610.
Deutzia corymbosa, 53696.
globosa, 53697.
longifolia veitchii, 53698.
Digitaria exilis, 53486, 53546.
Dioscorea alata, 52906–52908, 52927, 53475.
esculenta, 52905, 53443.
pentaphylla, 52867.
rotundata, 53006.
transversa, 52863.
trifida, 53444, 53495.
Diospyros conzattii, 53176.
discolor, 53555.
tupru, 53572, 53573.
Dolichos lablab, 53045, 53533, 53859.

Echinospermum lappula. See *Lappula myosotis*.
Eleusine coracana, 53622.
Elymus arenarius, 52880, 53046, 53144.
caput-medusae, 53047.
desertorum, 53100.
europaeus, 53048.
giganteus, 53049.
hirsutiglumis, 53050.
sibiricus, 53051.
virginicus submuticus, 53052.
Emmer, *Triticum dicoccum*, 53078.
Eragrostis abyssinica, 53476, 53477.
tremula, 53615.
Eranthis hyemalis, 53053, 53145.
Eriolaena hookeriana, 53574.
Eucalyptus risdoni, 53852.
Eugenia apiculata. See *E. luma*.
luma, 53591.
Euonymus hamiltonianus, 53699.
latifolius, 53700.
Euonymus planipes, 53701.
yedoensis, 53702.
Euphorbia royleana, 53575.

Fagraea auriculata, 53483.
Ferraria welwitschii, 53556.
Festuca bromoides, 53116.
Ficus macrophylla, 52865.
Flacourtia sepiaria, 53576.
Flax, *Linum usitatissimum*, 53860.
Forget-me-not, *Myosotis* spp., 53059, 53060, 53151, 53152.
Fragaria spp., 53853–53855.
Fundi, *Digitaria exilis*, 53486, 53546.

Gardenia latifolia, 53577.
Globeflower, *Trollius europaeus*, 53175.
Gossypium sp., 53492.
barbadense, 53263–53266, 53493.
Granadilla, *Passiflora maliformis*, 53180.
Grass, *Avena barbata wiestii*, 53626.
Axonopus sp., 52917.
beard, *Polypogon monspeliensis*, 53067.
bent, *Agrostis borealis*, 53125.
Brachiaria plantaginea, 52918.
brome, *Bromus* spp., 53036–53038, 53092, 53557.
false, *Brachypodium sylvaticum*, 53134.
Calamagrostis coarctata, 52955.
canary, *Phalaris bulbosa*, 53241.
Capriola spp., 52903, 52904.
Eragrostis tremula, 53615.
feather, *Stipa* spp., 53071, 53072, 53160.
fescue, *Festuca bromoides*, 53116.
foxtail, *Alopecurus pratensis*, 53465.
hair, *Aira* spp., 52872, 52873.
holy, *Torresia odorata*, 52888, 53174.
Johnson, *Holcus halepensis*, 52919.
Koeleria alpicola, 52881.
lyme, *Elymus* spp., 52880, 53046–53052, 53100, 53144.
melic, *Melica* spp., 52882, 53149, 53150.
millet, *Milium effusum*, 53058.
moor, *Sesleria coerulea*, 53159.
oat, downy, *Trisetum spicatum*, 52889.
tall, *Arrhenatherum elatius*, 53088.
Paspalum spp., 52920, 52921.
spear, *Poa* spp., 53064–53066, 53117, 53155–53157.
rooi, *Themeda triandra*, 53118.
Valota insularis, 52922.
wallaby, *Danthonia setacea*, 53115.
wheat, *Agropyron* spp., 52871, 53031, 53084, 53085, 53124.
Gynocardia odorata, 53121.

Helianthus annuus, 53240.

Hellebore. See *Helleborus foetidus.*
Helleborus foetidus, 53054, 53101, 53146.
Hibiscus sp., 52856.
Higacho, *Carica chrysopetala*, 53754.
Hiptage benghalensis, 53578.
madablota. See *H. benghalensis.*
Holarrhena antidysenterica, 53579.
Holcus halepensis, 52919.
sorghum, 53055, 53056, 53558–53562.
Honeysuckle, *Lonicera* spp., 53707–53716.
Honeywort, *Cerinthe* spp., 53039, 53093–53095, 53136.
Hordeum distichon palmella, 53102–53104.
nodosum, 53057.
secalinum. See *H. nodosum.*
spontaneum, 53147.
vulgare pallidum, 53239.
trifurcatum, 53105.
Hydnocarpus spp., 53472, 53473.
wightiana, 52859.
Hydrangea petiolaris, 52937.
Hyoscyamus muticus, 53543.
Hyphaene thebaica, 53848.

Ilex sp., 53452.
Ipomoea sp., 53843.
ficifolia, 53609.
Iris bulleyana, 53703.
clarkei, 53704.
forrestii, 53705.
mellita, 53706.

Juglans sp., 53198.
Justicia adhatoda, 53580.
Jute, nalta, *Corchorus olitorius*, 52890–52892.

Khaya nyasica, 53474.
Koeleria alpicola, 52881.

Lagerstroemia parviflora, 53581, 53582.
Lappula myosotis, 53148.
Larkspur, *Delphinium* spp., 53044, 53097–53099, 53142, 53143.
Laurocerasus ilicifolia, 52923.
Lecythis zabucajo, 53850.
Leucomeris spectabilis, 53583.
Leycesteria formosa, 52864.
Lilium neilgherrense, 52924, 52926.
nepalense, 52925.
Lily, *Lilium* spp., 52924–52926.
Linum usitatissimum, 53860.
Lonicera alpigena, 53707.
deflexicalyx, 53708.
dioica, 53709.
lanceolata, 53710.
longa, 53711.
maackii, 53712.
obovata, 53713.
quinquelocularis translucens, 53714.
ruprechtiana, 53715.
trichosantha, 53716.
Lotus sp., 53447.
uliginosus, 53446.
Love-in-a-mist, *Nigella damascena*, 53061, 53106, 53153.
Luffa aegyptiaca. See *L. cylindrica.*
cylindrica, 52952.
Lumbang, *Aleurites moluccana*, 53547.
Lupine, blue, *Lupinus angustifolius*, 53549.
yellow, *L. luteus*, 53550.
Lupinus angustifolius, 53549.
luteus, 53550.

Mabolo, *Diospyros discolor*, 53555.
Mahogany, African, *Khaya nyasica*, 53474.
Mallotus philippinensis, 53584.
Malus doumeri, 53008.
laosensis, 52900.
pumila, 53380.
sylvestris, 53381–53401.
Maximilianea gossypium, 53585.
Meadow rue, *Thalictrum* spp., 52886, 52887, 53073–53076, 53110–53112, 53162–53173.
Medicago sativa, 53448.
Melica ciliata, 53149.
nutans, 52882, 53150.
Melilotus alba, 52916, 53621.
Milium effusum, 53058.
Millet, pearl, *Pennisetum glaucum*, 53063, 53623.
ragi, *Eleusine coracana*, 53622.
Mock orange, *Philadelphus* spp., 53718–53726.
Monkshood, *Aconitum* spp., 52870, 53081–53083, 53122, 53123.
Morning-glory, *Ipomoea* spp., 53609, 53843.
Musa sp., 53119.
Myosotis arvensis, 53059, 53151.
palustris. See *M. scorpioides.*
scorpioides, 53060.
stricta, 53152.
Myrica rubra, 53453.

Naranjilla, *Solanum quitoense*, 52866.
Nathusia swietenioides, 53586.
Nigella damascena, 53061, 53106, 53153.
Nonnea rosea, 52883, 53062, 53107, 53154.

Oat, *Avena* spp., 53130–53133, 53624.
Ochroma lagopus, 53262, 53490.
Onion, *Allium cepa*, 52913.
Onoseris salicifolia, 53178, 53756.
Orache, *Atriplex hortensis*, 52893.
Ornithopus sativus, 53551.
Oryza sativa, 53861, 53862.
Osteomeles obtusifolia, 53485.

Pai ts'ai, *Brassica pekinensis*, 52910.
Palangi, *Brassica rugosa*, 53542.
Palm, *Caryota* sp., 53120.
doum, *Hyphaene thebaica*, 53848.
macauba, *Acrocomia sclerocarpa*, 53487.
rattan, *Calamus* sp., 52902.
Trachycarpus martianus, 53471.

Papaya, *Carica papaya*, 53761.
Paspalum spp., 52920, 52921.
Passiflora maliformis, 53180.
Pea, garden, *Pisum sativum*, 53863.
Peach, *Amygdalus persica*, 52898.
Pear, *Pyrus communis*, 53428–53441.
Pennisetum glaucum, 53063, 53623.
typhoideum. See *P. glaucum*.
Pepper, *Capsicum annuum*, 53857.
Pernettya mucronata, 53717.
Persea sp., 53243.
americana, 53182–53185, 53895.
gratissima. See *P. americana*.
Persimmon, *Diospyros conzattii*, 53176.
Peucedanum ostruthium, 52860.
Phalaris bulbosa, 53241.
Phaseolus calcaratus, 52857.
coccineus, 53244, 53269–53272, 53500–53511, 53763, 53779, 53788, 53790, 53796–53799, 53801–53803, 53806, 53809–53812, 53818, 53819, 53836, 53841, 53867, 53869–53872, 53879, 53894.
lunatus, 53199–53215, 53273, 53274, 53762, 53780, 53835, 53868, 53891.
vulgaris, 53245–53261, 53275–53377, 53512–53527, 53532, 53764–53778, 53781–53787, 53789, 53791–53795, 53800, 53804, 53805, 53807, 53808, 53814–53817, 53820–53823, 53825–53834, 53837–53840, 53842, 53873–53878, 53880–53890, 53892, 53893.
Philadelphus acuminatus, 53718.
brachybotrys, 53719.
incanus, 53720.
inodorus, 53721.
latifolius, 53722.
satsumi, 53723.
sericanthus, 53724.
speciosissimus, 53725.
wilsonii, 53726.
Phleum pratense, 53466, 53467.
Pigeon-pea, *Cajan indicum*, 53238, 53856.
Pine, *Pinus massoniana*, 53849.
Pinus massoniana, 53849.
Pisum sativum, 53863.
Pleiogynium solandri, 52897.
Plum, *Prunus* sp., 53427.
Poa sp., 53117.
alpina, 53064, 53155.
caesia, 53065, 53156.
chaixii, 53066, 53157.
Polymnia edulis, 52894.
Polypogon monspeliensis, 53067.
Potato. See *Solanum tuberosum*.
Dunnotar Castle, *Solanum tuberosum*, 52901.
wild, *Solanum commersonii*, 53846.
Prune, *Prunus domestica*, 53402–53414.
Prunus spp., 53416–53427, 53442.
armeniaca, 52914.
domestica, 53402–53414.
ilicifolia. See *Laurocerasus ilicifolia*.
mahaleb, 53415.
persica. See *Amygdalus persica*.
Pterocarpus erinaceus, 52912.
Pyracantha gibbsii, 52938.
Pyrus communis, 53428–53441.
laosensis. See *Malus laosensis*.
malus. See *Malus sylvestris*.

Randia uliginosa, 53587.
Ranunculus aconitifolius, 53158.
auricomus, 53108.
Raspberry, *Rubus* spp., 53186, 53218, 53480–53482, 53625, 53759, 53760, 53847.
Rhododendron brachycarpum, 53727.
davidsonianum, 53728.
decorum, 53729.
racemosum, 53730.
Ribes vulgare, 53220–53237.
Rice, *Oryza sativa*, 53861, 53862.
Ricinus communis, 52953, 52954, 53242.
Rollinia emarginata, 53616.
Rosa sp., 53743.
cinnamomea, 53731.
davidii, 53732.
elongata, 53733.
longicuspis, 53734.
mollis, 53735.
omeiensis, 53736, 53737.
pteracantha, 53738.
pendulina. See *R. cinnamomea*.
serafinii, 53739.
sertata, 53740.
sinowilsoni. See *R. longicuspis*.
webbiana, 53741.
woodsii, 53742.
Rose. See *Rosa* spp.
Rubus spp., 53378, 53379, 53545.
adenophorus, 52939.
adenotrichos, 53219.
alleghaniensis, 52940.
biflorus quinqueflorus, 52941, 53535.
chroosepalus, 52942, 53536.
flosculosus, 52943.
giraldianus, 52944.
inopertus, 52945.
lasiostylus, 52946.
dizygos, 52947.
macraei, 53480–53482, 53625, 53759, 53760, 53847.
omeiensis, 53537.
parvifolius, 52948.
phoenicolasius, 52949.
pubescens, 52950.
roseus, 53186, 53218.
thibetanus, 53538.
veitchii, 53539.
xanthocarpus, 52951, 53540.
Rye, *Secale* spp., 52884, 53069.

Saccharum officinarum, 53528–53531.
Sage. See *Salvia* spp.
Salpichroa rhomboidea, 53608.
Salvadora persica, 53845.
Salvia pratensis, 53068.
squalens, 53757.
Sapote, white, *Casimiroa* spp., 53491, 53496.

Sapucaia nut, *Lecythis zabucajo*, 53850.
Schrebera swietenioides. See *Nathusia swietenioides*.
Sclerocarya birrea, 52915.
caffra, 53753.
Secale sp., 52884.
fragile, 53069.
Senecio pimpinellaefolius, 53758.
Senna, bladder. See *Colutea* spp.
Serradella, *Ornithopus sativus*, 53551.
Sesamum orientale, 53864.
Sesleria coerulea, 53159.
Sidalcea malvaeflora, 53070.
Snapdragon. *Antirrhinum orontium*, 53086, 53127.
Solanum commersonii, 53846.
maglia, 53445.
quitoense, 52866.
sp., 53187.
tuberosum, 52901, 53188–53197, 53216, 53463, 53464, 53494, 53617–53620.
Sorghum, *Holcus sorghum*, 53055, 53056, 53558–53562.
Sorghum halepense. See *Holcus halepensis*.
vulgare. See *Holcus sorghum*.
Spelt, *Triticum spelta*, 53114.
Spondias pleiogyna. See *Pleiogynium solandri*.
Sterculia macrophylla, 53484.
urens, 53588.
Stickweed, *Lappula myosotis*, 53148.
Stipa capillata, 53071.
pennata, 53072, 53160.
Strawberry, *Fragaria* spp., 53853–53855.
Styphelia grayana, 53478, 53479.
Sugar cane, *Saccharum officinarum*, 53528–53531.
Sunflower, *Helianthus annuus*, 53240.
Symphytum asperrimum, 53161.
officinale, 52885, 53109.

Tabernaemontana donnell-smithii, 53614.
Tacsonia quitensis, 53181.
Taraktogenos kurzii, 53844.
Teff, *Eragrostis abyssinica*, 53476, 53477.
Terminalia myriocarpa, 53470.
tomentosa, 53589.
Thalictrum angustifolium, 53110, 53162.
aquilegifolium, 53163.
delavayi, 53164.
dipterocarpum, 53111.
fendleri, 53165.
flavum, 53073, 53112, 53166.
flexuosum, 53074, 53075.
foetidum, 53076, 53167.
glaucum, 52886, 53168.
kemense, 53169.
minus, 53170, 53171.
nutans, 52887.
Thalictrum polygamum, 53172.
simplex, 53173.
Themeda triandra, 53118.
Timothy, *Phleum pratense*, 53466, 53467.
Tocte, *Juglans* sp., 53198.
Torresia odorata, 52888, 53174.
Trachycarpus martianus, 53471.
Trifolium glomeratum, 53007, 53541.
pratense, 53552–53554.
repens, 53449, 53450.
Trisetum spicatum, 52889.
Triticum aestivum, 52956–52999, 53548, 53590, 53865.
aestivum × *ovatum*, 53079.
bicorne, 53077, 53113.
dicoccum, 53078.
durum, 53000–53005, 53544.
spelta, 53114.
vulgare. See *T. aestivum*.
Trollius europaeus, 53175.

Vaccinium meyenianum, 53488.
Vallaris heynei, 53592.
Valota insularis, 52922.
Viburnum cotinifolium, 53744.
dilatatum, 53745.
hupehense, 53746.
ichangense, 53747.
lobophyllum, 53748.
ovatifolium, 53749.
rhytidophyllum, 53750.
theiferum, 53751.
veitchii, 53752.
Vigna cylindrica, 53080.
sinensis, 52862, 53813, 53824, 53866.

Walnut, *Juglans* sp., 53198.
Wheat, *Triticum* spp.:
common, *T. aestivum*, 52956–52999, 53548, 53590, 53865.
durum, *T. durum*, 53000–53005, 53544.
hybrid, *T. aestivum* × *ovatum* 53079.
wild, *T. bicorne*, 53077, 53113.
Wineberry, *Rubus phoenicolasius*, 52949.

Yam, Guinea, *Dioscorea rotundata*, 53006.
greater, *Dioscorea alata*, 52906–52908, 52927, 53475.
lesser, *Dioscorea esculenta*, 52905, 53443.
Queensland, *Dioscorea transversa*, 52863.
round, *Dioscorea pentaphylla*, 52867.
Yampi, *Dioscorea trifida*, 53444, 53495.

Zea mays, 52911, 53217, 53595–53606.
Ziziphus jujuba. See *Z. mauritiana*.
mauritiana, 52858.
xylopyrus, 53593.

Issued October, 1923.

U. S. DEPARTMENT OF AGRICULTURE.
BUREAU OF PLANT INDUSTRY.

INVENTORY

OF

SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM JULY 1 TO SEPTEMBER 30, 1921.

(No. 68; Nos. 53896 to 54425.)



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CONTENTS.

	Page.
Introductory statement	1
Inventory	5
Index of common and scientific names	61

ILLUSTRATIONS.

	Page.
PLATE I. The edible bamboo of the eastern Himalayas. (*Dendrocalamus hamiltonii* Nees and Arn., S. P. I. No. 53909)	8
II. One of the handsomest flowering trees of the Tropics (*Spathodea campanulata* Beauv., S. P. I. No. 53983)	8
III. A fruiting branch of the Andean currant. (*Ribes punctatum* Ruiz and Pav., S. P. I. No. 53994)	18
IV. The huantuc, a favorite ornamental plant of the Quichua Indians. (*Datura rosei* Safford, S. P. I. No. 54049)	18

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INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM JULY 1 TO SEPTEMBER 30, 1921 (NO. 68; NOS. 53896 TO 54425).

INTRODUCTORY STATEMENT.

Almost every one of the plants described in this inventory opens up a vista of romance to any person who is interested in plants.

We have read these descriptions now for 23 years, and each new inventory brings as we read it new thrills. We want to grow almost every plant and be on hand at its first performance, when it begins to loom up as something of more value to America than a mere curiosity.

If the inventory is read hastily by anyone the effect produced is bewildering, but if the reader will rivet his attention on those plants which particularly strike his fancy he will desire to experiment with some of them. Out of these desires comes the usefulness of these plants to the country. It is beyond the range of human possibility for any one person to test thoroughly very many of these new plants, but if each of our thousands of experimenters makes a home for a few the aggregate of information which will accumulate will be very great indeed.

In singling out for special mention certain of the plants described in this inventory, it should be understood that the writer is merely pointing to those which, from his experience with new foreign plants, strike his fancy and seem to offer more to the experimenter than do others. Among those not mentioned, just as likely as not, are the prize packages of the collection.

The fact that the cost of procuring certain plants is great naturally enhances their value in one's mind. Among those first described here, therefore, as worthy of mention are those collected by our agricultural explorer, Wilson Popenoe, in the back country of Ecuador, more particularly the Chota Valley. Of all the regions visited by him during his years of exploration in Central America and South America, none perhaps has afforded more actual discomfort and danger than this Chota Valley of Ecuador, with its primitive civilization and its malaria-carrying mosquitoes. It is gratifying, therefore, to be able to state that he collected there plant material which to his experienced judgment looks unusually promising. He found a new center of avocado seedlings, which he believes may prove of unusual importance to those who want hardier forms that are as large as fanciers demand. His Tamayo variety

(No. 54270), an 18-ounce avocado with all the earmarks of a hybrid between the hardy Mexican and the true West Indian races, with all that this may mean in the way of increased vigor and hardiness and better fruiting habits, can not fail to attract the notice of those engaged in building up this new industry, avocado production. It is true, others of the collection (Nos. 54270 to 54278) made in this valley may ultimately surpass it in flavor.

A new blackberry (No. 54279); a large-fruited wild blackberry (No. 54280); a wild Andean currant with orange-yellow fruits on racemes 2 inches long, which may make possible a race of currants for the Southern States (No. 53994); as well as the white blackberry (No. 53955), which Mr. Popenoe considers one of the most promising species of Rubus yet collected in South America, should all be given the careful attention which they deserve.

The wild potato (No. 54060) from an altitude of 11,500 feet in the mountains of Ecuador will perhaps be a disappointment to the pathologists, inasmuch as it appears to be attacked by the potato blight, much as the cultivated varieties are, but it may at least help to settle the origin of this disease.

Dr. W. A. Orton's studies of those vegetables which can be eaten by persons affected by diabetes have already attracted wide attention in medical circles, and our search for foreign species which may add to his already large collection has brought in 13 East Indian species (Nos. 53896 to 53908) through the kindness of Mr. Lane, of the Botanic Garden in Calcutta, India. These include potherbs and cucurbits which it is to be hoped may help Doctor Orton to diversify the restricted menu of sufferers from this ailment.

For those who have an experimental corner in their vegetable gardens there are in this inventory several interesting things. The acorn (*Dioscorea latifolia*, No. 53925.), which bears its good-sized tubers in the axils of the leaves; the Southern Rhodesian *Coleus rotundifolius* (No. 54321), tubers of which Mr. Thompson described as an excellent substitute for the white potato; and a remarkable collection (Nos. 54411 to 54424) of the rare type of Japanese vegetables belonging to the mustard family, sent by Doctor Onda, of the Imperial Horticultural Experiment Station at Okitsu, are among the most interesting.

Forage-crop specialists will want to test the drought resistance of Doctor Proschowsky's strain of creeping white clover (*Trifolium repens*, No. 53912) which along the flat meadowlands bordering the River Var is cut five times a year for its hay, and of Pole Evans's two South African grasses (Nos. 53956 and 53957), which form a highly relished part of the forage eaten by the game animals of that great wild stock region; or perhaps they will desire to take the advice of Doctor Trabut and try to hybridize *Trifolium panormitanum* (No. 54032) with *T. alexandrinum*, the great berseem clover of the Nile Valley, which has all but succeeded in America and has made such a success in Italy and Algeria; or to test in the Southern States the native wild grasses (*Aristida* spp., Nos. 54396 to 54399) of Angola, which Mr. Gossweiler, of Loanda, has sent.

Mr. Buck, of the College of Agriculture and Forestry, of Nanking, China, has secured for us seeds in quantity of the forest tree *Catalpa bungei* (No. 53989), to whose excellent qualities Frank N. Meyer

called attention when he sent in the first seeds. Its soft light wood, which is easily split, becomes durable when dry, and is used for furniture and building purposes and for wood carving by the Chinese, has evident adaptation to American conditions, as is proved by the trees which have grown from the seed Mr. Meyer sent, making this species worthy of serious study by foresters.

A large species of timber bamboo which flowers regularly and grows to be 60 feet tall can fail to interest us only if it refuses to grow in our Southern States. We are indebted to Mr. Hole, the forest botanist of Dehra Dun, India, for the seeds of this interesting species, *Dendrocalamus longispathus* (No. 54045).

The attention of cerealists should be called to the remarkable collection of Indo China rice selections (*Oryza sativa*, Nos. 54282 to 54296) which Mr. Carle, of the Genetic Laboratory of Saigon, has sent; among them are four (Nos. 54289 to 54292) of the so-called floating rices, having a different flavor from ordinary rice, which are flooded every year from July to November by the Mekong River and root freely from their upper nodes; also to the soft-shelled variety of Job's-tears (*Coix lacryma-jobi ma-yuen*, No. 54310), which, according to Señor Hernandez, Director of Agriculture of the Philippine Islands, is becoming a valuable crop for tropical agriculturists.

Of new fruit-bearing trees and shrubs the gai yuen tao (*Prunus glandulosa*, No. 54028), of China, has proved itself of value as a dooryard shrub as far north as Rochester, N. Y., where it has fruited repeatedly for Mr. Dunbar, to whom we are indebted for a quantity of seeds; it is attractive when in bloom and its enormous crop of brilliant-red refreshing fruits are the delight of little children. Florida mango growers will be eager for more details about the Pachmarhi mango (*Mangifera indica*, No. 54041), seedlings of which Mr. Bembower reports are considered resistant to frost in Pagara, India. The seedless white sapote (*Casimiroa* sp., No. 54046), which Milo Baker sends from Los Angeles, Calif., and the Costa Rican variety *C. edulis* (No. 54051) with fruits weighing 1½ pounds, secured by Mr. Wercklé, will add two new varieties to the collection of this interesting new subtropical fruit which we are getting together in southern Florida.

For the plant breeders who are interested in creating forms of apples, pears, barberries, or roses, we have assembled, through the courtesy of Professor Sargent, of the Arnold Arboretum, and Mr. Dunbar, assistant superintendent of the Rochester Parks, collections (Nos. 54061 to 54265) of very unusual value. These include a large number of wild species gathered by many years of effort and should find their places in the collections of the universities in the Northern States, where these plants form such important industries.

To those who have found how excellent are some of the new fruits originated by H. R. Wright, of Avondale, New Zealand, the new aphis-resistant apple stocks and other new prune and apple varieties (Nos. 54385 to 54395) will appeal.

To lovers of ornamental plants the gift of Hon. Vicary Gibbs, *Lonicera syringantha* (No. 54058), with its large daphnelike blooms, which have the fragrance of hyacinths, can not fail to appeal, and

it may be a satisfaction to that veteran plant lover of England to feel that he has given to the dooryards of this country so lovely a shrub.

Pole Evans has sent some bulbs of the little South African gladiolus, which has bulbs the size of a pea (*G. alatus*, No. 54304) and ought to be interesting to the breeders of gladioli.

Though the seed failed to grow and it may be another year before we get more of it, we can not refrain from calling the attention of all tropical botanic gardens to the gorgeous ornamental plant, whose meter-long scarlet sprays, composed of the enlarged sepals of the inconspicuous flowers, splashed the landscape with scarlet near the Rio Sucio on Gatun Lake last summer when P. H. Dorsett and the writer were visiting the jungles of the Canal Zone. It is difficult to pardon the botanist Klotzsch for attaching to so gorgeous a plant the almost unpronounceable name of *Warszewiczia coccinea* (No. 54297).

Although the opinion of the chemists seems to preclude the probability that *Stevia rebaudiana* (No. 53918), which at one time alarmed the sugar planters by its reputed sweetness, will ever become a commercial crop, the introduction and trial in our country of so interesting a composite is surely warranted.

The botanical determinations of seeds introduced have been made and the nomenclature determined by H. C. Skeels, and the descriptive and botanical notes have been arranged by G. P. Van Eseltine, who has had general supervision of this inventory. Miss Patty T. Newbold has assisted in the compilation of descriptive notes.

David Fairchild,
Agricultural Explorer in Charge.

Office of Foreign Seed and Plant Introduction,
Washington, D. C., December 12, 1922.

INVENTORY.[1]

53896 to 53908.

From Sibpur, near Calcutta, India. Seeds presented by G. G. Lane, curator, Royal Botanic Garden, through Lieut. Col. A. T. Gage, director, Botanical Survey of India. Received July 7, 1921.

The following vegetables, requested for experimental work on food for diabetics, are used for food in India according to Watt, Dictionary of the Economic Products of India, from which the notes that follow are adapted.

53896. AMARANTHUS GANGETICUS L. Amaranthaceæ. **Amaranth.**

A small annual, common in Bengal and Assam and now extensively cultivated in many parts of the world as a green vegetable. The leaves and tender stalks are made into a curry by all classes of natives. The young stems are sometimes used as a substitute for asparagus on the English table. (*Vol. 1, p. 212.*)

For previous introduction, see S. P. I. No. 34457.

53897. AMARANTHUS PANICULATUS L. Amaranthaceæ. **Amaranth.**

A heavily fruiting, short-season crop, one of the most important sources of food to the hill tribes of India. Although, no doubt, the young tops are to a certain extent eaten as a vegetable, the small seed is the product for which it is cultivated. (*Vol. 1, p. 211.*)

For previous introduction, see S. P. I. No. 44178.

53898. CHENOPODIUM ALBUM L. Chenopodiaceæ.

A plant common throughout the tropic and temperate Himalayas, ascending to 12 000 feet from Kashmir to Sikkim and to 14,000 feet in Tibet; it is general in the plains of India. This plant is cultivated by the hill tribes on the higher western Himalayas, and the wild plant is also regularly collected and eaten as a potherb and green vegetable. The seed of the cultivated plant is the principal product, but the leaves and twigs are also eaten as a spinach. It is entirely a rain crop, and attains a height of 6 feet. The leaves are rich in mineral matter, particularly potash salts. They likewise contain a considerable quantity of albuminoids and other compounds of nitrogen. The seeds are said to be superior to buckwheat. (*Vol. 2, p. 265.*)

For previous introduction, see S. P. I. No. 51214.

53899 to 53901. CUCUMIS MELO L. Cucurbitaceæ. **Muskmelon.**

53899. *Sweet melon.* An herbaceous climber, said to be native to northwestern India, Baluchistan, and west tropical Africa; extensively cultivated for its fruit in the sandy basins of rivers. The fruit is round, green or yellowish, the skin covered with a network of raised brown lines. The fruit is eaten uncooked in a variety of

[1] It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in these inventories are those which the material bore when received by the Office of Foreign Seed and Plant Introduction and, further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in these inventories will in many cases undoubtedly be changed by the specialists interested in the various groups of plants and the forms of the names brought into harmony with recognized American codes of nomenclature.

53896 to 53908—Continued.

ways. The pulp is usually sweetish and pleasant and is eaten by Europeans as well as by natives. A sweet edible oil is obtained from the seeds, and the seeds and fruit pulp are used medicinally. (*Vol. 2, p. 627.*)

53900. Var. *utilissima*. A form cultivated in Bengal, the Northwest Provinces, and the Punjab during the hot weather and the rains. The fruit varies from short oval or cylindric to elongate, 2 to 5 feet long, and is either straight or curved like some varieties of cucumber. It varies in color from dark green to nearly white, usually changing to a bright-orange color when ripe. When young it is much eaten by Europeans in the Northwest Provinces in lieu of cucumbers, being in season long before that vegetable, but not so highly flavored. When little more than half grown they are pickled; when ripe they have much the flavor of the melon, and will keep for several months if carefully gathered and hung up. They are also eaten raw and are much used in curries. A sweet edible oil is obtained from the nutritious seeds, which are also used medicinally. (*Vol. 2, p. 631.*)

53901. Received as *Cucumis momordica*.

53902. LUFFA ACUTANGULA (L.) Roxb. Cucurbitaceæ. **Gourd.**

A climber, native to northwest India, Sikkim, Assam, and eastern Bengal. The fruit is highly esteemed by natives and is eaten in curries or dressed with clarified butter. When half grown it is one of the best indigenous Indian vegetables, peeled, boiled, and dressed with butter, pepper, and salt. When fully developed it is about a foot long, but if allowed to grow longer than 4 inches it rapidly deteriorates in quality. The fruits, seeds, and leaves are used medicinally, and the dried fibrous rind is used as a brush for sizing paper. (*Vol. 5, p. 94.*)

For previous introduction, see S. P. I. No. 51230.

53903. LUFFA CYLINDRICA (L.) Roemer. Cucurbitaceæ. **Gourd.**
(*L. aegyptiaca* Mill.)

A native of India, cultivated or naturalized in most hot countries of the world. In India it is common everywhere and is often cultivated, especially on the plains. The fruit, which is smaller than that of *L. acutangula*, is edible and is similarly used in curries, etc., by the natives. An oil is obtained from the seeds; the seeds are used medicinally; and the dry fruit, which is filled with an interwoven network of fiber, is used as a flesh brush in Turkish baths. (*Vol. 5, p. 96.*)

For previous introduction, see S. P. I. No. 49163.

53904. MIRABILIS JALAPA L. Nyctaginaceæ.

A yellow, purple, or magenta flowered plant cultivated or spontaneous over the greater part of India, being equally plentiful in the hotter valleys of the northwest Himalayas, from the plains up to 7,000 feet, and in the far east in Bengal, Manipur, and Burma. The plant is often so prevalent near village sites as to exclude all other vegetation. The leaves are said to be largely used as a vegetable at Ooson in the Salem District. The powdered root and seeds are used in cosmetics, and the root and leaves are used medicinally. (*Vol. 5, p. 253.*)

For previous introduction, see S. P. I. No. 47589.

53905. OCIMUM TENUIFLORUM L. Menthaceæ.
(*O. sanctum* L.)

A somewhat shrubby herbaceous plant found throughout India, Burma, and Ceylon and distributed in the Malay Archipelago, Australia, western Asia, and Arabia; it is cultivated occasionally as a potherb by Europeans, for which purpose it is very useful. The leaves, seeds, and flowers are used in native medicine. (*Vol. 5, p. 444.*)

53896 to 53908—Continued.

53906. RUMEX MARITIMUS L. Polygonaceæ.

An annual common in marshes in Assam, Bengal, and the plains of northern India. In the Punjab Himalayas it is found in similar localities up to 12,000 feet. It is distributed to Europe, Asia, North Africa, and North and South America. The plant has cooling properties and is often eaten by natives as a potherb especially in the warm weather. The leaves are used medicinally. (*Vol. 6, pt. 1, p. 591.*)

53907. RUMEX VESICARIUS L. Polygonaceæ.

An annual 6 to 12 inches high, native to the western Punjab, the Salt Range, and the Transindus Hills and cultivated throughout India as a vegetable; it is eaten either raw or cooked. It is usually grown in patches near a well and may be procured almost all the year round. The entire plant is used medicinally. (*Vol. 6, pt. 1, p. 592.*)

53908. TRICHOSANTHES ANGUINA L. Cucurbitaceæ.

An annual creeper which probably was originally wild in India or the Indian Archipelago. It is cultivated throughout India as a rainy season crop for its long cucumberlike fruits, which are cooked and eaten as a vegetable, either boiled or in curries. When young it is prettily striped with white and green; when ripe it varies in length from 1 to 3 feet and is of a brilliant orange color. If gathered when very young, less than 4 inches in length, and cut into thin strips, it may be cooked in the same way as French beans and forms a very fair substitute for that vegetable. (*Vol. 6, pt. 4, p. 81.*)

For previous introduction, see S. P. I. No. 51824.

53909. DENDROCALAMUS HAMILTONII Nees and Arn. Poaceæ.

Bamboo.

From Dehra Dun, India. Seeds presented by R. S. Hole, forest botanist, Forest Research Institute and College. Received July 29, 1921.

The common bamboo of the eastern Himalayas with large stems 3 to 6 inches in diameter, rather hollow and not always straight, but used for every variety of purpose. This bamboo grows gregariously on hillsides up to 3,000 feet, and the stems are 40 to 60 feet high. They often grow low and tangled instead of straight; the bamboo may be recognized by this characteristic and by the very thick shoots which grow out at the nodes. The young shoots are eaten. (Adapted from *Gamble, A Manual of Indian Timbers, p. 430.*)

A forest growth of this edible bamboo is shown in Plate I.

For previous introduction see S. P. I. No. 48266.

53910 to 53912.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky, Jardin d'Acclimatation. Received July 19, 1921. Quoted notes by Doctor Proschowsky.

53910. CENTAUREA CANARIENSIS Willd. Asteraceæ.

"A rather large bush which is very drought resistant. When covered with its large purple flowers it is rather ornamental."

Native to the island of Teneriffe, Canary Islands.

53911. CENTAUREA RAGUSINA L. Asteraceæ.

"An exceedingly ornamental bushy Dalmatian plant with yellow flower heads and white silky-tomentose foliage, sometimes nearly 6½ feet across, which grows on almost perpendicular rocks and on walls of masonry where it is planted or naturalized, since it is not wild here."

For previous introduction, see S. P. I. No. 48027.

53910 to 53912—Continued.

53912. TRIFOLIUM REPENS L. Fabaceæ. **White clover.**

"On the very few flat meadowlands along the lowest part of the little river Var the herbaceous growth is cut five times yearly, green fodder being very much in demand in this exceedingly dry climate, so I could not find any ripe seeds on the plants which are found here and there on these little meadows. But with my two sons I started on an excursion and found a few scattered plants on somewhat drier ground, though apparently it does not exist on the sunburnt hillsides. We managed to gather a few seeds more or less ripe. Perhaps you may find, after all, that the plant growing here may be more drought resistant than the ordinary clovers. We have had no rain of any importance since September."

53913 and 53914. TRIFOLIUM spp. Fabaceæ.

From Melbourne, Victoria. Seeds purchased from F. H. Brunning. Received August 2, 1921.

53913. TRIFOLIUM FRAGIFERUM L. **Strawberry clover.**

"*Tarwei* variety." (*Brunning.*)

"A creeping perennial clover of possible value as a forage and lawn plant in the cooler and intermountain regions of the United States." (*F. N. Meyer.*)

For previous introduction, see S. P. I. No. 29263.

53914. TRIFOLIUM SUBTERRANIUM L. **Subterranean clover.**

"One of the most nutritious plants known to agriculture, indigenous to Britain, found growing on dry, sandy, gravelly soil. The stems grow over each other to a depth of 6 or 7 inches, the lower ones being as healthy as those above." (*Brunning.*)

For previous introduction, see S. P. I. No. 52335.

53915 to 53917.

From Guatemala, Guatemala. Seeds presented by Sr. Ad. Tonduz, Dirección General de Agricultura. Received June 29, 1921. Numbered July, 1921. Quoted notes by Sr. Tonduz.

53915 and 53916. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.** (*T. vulgare* Vill.)

53915. "*No. 107b.* From San Miguel Acatan, Huehuetenango."

53916. "*No. 108. Trigo sipac.* From Patzum, Chimaltenango."

53917. PISUM SATIVUM L. Fabaceæ. **Garden pea.**

"*No. 98.* From San Pedro las Huertas, Sacatepequez."

53918. STEVIA REBAUDIANA Bertoni. Asteraceæ.

From Buenos Aires, Argentina. Plants presented by the director of the Botanic Gardens, Asuncion, Paraguay, through D. S. Bullock, agricultural trade commissioner, United States Department of Agriculture, American Embassy, Buenos Aires. Received July 25, 1921.

"This plant has been the subject of at least two rather detailed researches, as follows: Rasenack, P., Über die Süss-stoffe des Eupatorium rebaudianum und des Süssholzes, in Arbeiten aus dem Kaiserlichen Gesundheitsamte, 28 (1908), 420–443, and Dieterich, Karl, Über die Bestandteile der Paraguay-Süss-stoffpflanze Eupatorium rebaudianum, Kaâ-Heé, und ihre pharmazeutische Verwertbarkeit, in Pharmazeutische Zentralhalle, 50 (1909), 435–440; 458–462.

"The latter reported the presence of two glucosides, rebaudin and eupatorin, whereas Rasenack found only one, which he terms only eupatoriumsüss-stoff. Both investigators were interested in this material as a possible substitute



THE EDIBLE BAMBOO OF THE EASTERN HIMALAYAS. (DENDROCALAMUS HAMILTONII NEES AND ARN., S. P. I. No. 53909.)

Like several other bamboos the young shoots of this species are a delicious vegetable. They suggest gigantic asparagus tips, but are more firm and crisp in texture. For its valuable timber, as well as for its edible shoots, the species is worthy of trial in the southern United States, where the Asiatic bamboos promise to become of economic importance. (Photographed by J. F. Rock, Berjan Forest Reserve, Assam, February, 1921; P22721FS.)



ONE OF THE HANDSOMEST FLOWERING TREES OF THE TROPICS. (SPATHODEA CAMPANULATA BEAUV., S. P. I. No. 53983.)

The Torrid Zone is famous for its flowering trees, some of which are gorgeous in the extreme. Like the royal poinciana, the amherstia, and the browneas, *Spathodea campanulata* bears flaming-red flowers of striking beauty. It succeeds in southern Florida and is highly esteemed in Hawaii. (Photographed by Wilson Popenoe, Cocoanut Grove, Fla., April 15, 1916; P16718FS.)

for licorice, but determined that the active principles were not closely allied to glycyrrhizin. Dieterich reports that the glucosides are present in very small quantities, that their isolation is rather expensive and attended by considerable difficulty, and that the crude preparation comparable to licorice extract is with difficulty soluble and has a very bitter aftertaste. He states also that the plant is a very small one which occurs only in the mountainous regions of Paraguay. For these reasons he is very skeptical as to its potential commercial value, although both he and Rasenack suggest the advisability of cultivation experiments outside of South America." (*E. E. Stanford.*)

For previous introduction, see S. P. I. No. 47515.

53919. Datura suaveolens Humb. and Bonpl. Solanaceæ.

From Buitenzorg, Java. Seeds presented by Dr. P. J. S. Cramer, chief, Plant Breeding Station. Received August 6, 1921.

"A plant native to Minas Geraes and Sao Paulo, Brazil, common in the Antilles, and much cultivated in the Tropics and in conservatories for its very large nodding white flowers. Distinguished from *Datura arborea* and *D. ruizii* by its inflated 5-toothed calyx and its long slender fusiform fruit." (*W. E. Safford.*)

A handsome plant 15 to 20 feet high, with smooth elliptic leaves, downy beneath; sometimes 300 of the very large pure-white sweet-scented pendent flowers are open at once. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 2, p. 593.*)

53920 and 53921.

From Chester, England. Seeds purchased from James Hunter. Received August 5, 1921.

53920. Anthyllis vulneraria L. Fabaceæ. Kidney vetch.

A perennial plant found wild over a large part of Europe. It grows naturally along roadsides, wherever the soil is dry and thin and the subsoil calcareous. It was first introduced into cultivation by a German peasant about 40 years ago. (Adapted from *Division of Agrostology Circular 6, p. 7.*)

For previous introduction, see S. P. I. No. 7721.

53921. Sanguisorba minor Scop. Rosaceæ. Burnet. (*Poterium sanguisorba* L.)

The "salad burnet," an exceedingly hardy and long-lived perennial native to France, up to 2 feet high; the young leaves, resembling the cucumber in flavor, are used as a salad. (Adapted from *Robinson, The Vegetable Garden, p. 116.*)

For previous introduction, see S. P. I. No. 29800.

53922. Cocos nucifera L. Phœnicaceæ. Coconut palm.

From Buitenzorg, Java. Seeds presented by Dr. W. M. Docters van Leeuwen, director, Botanic Garden. Received August 11, 1921.

Probably the same as S. P. I. No. 52854, but we have as yet no information which permits us to identify it unquestionably with that number.

53923. Polyalthia longifolia (Sonner.) Benth. and Hook. Annonaceæ.

From Honolulu, Hawaii. Plants presented by Dr. H. L. Lyon, in charge, department of botany and forestry, experiment station of the Hawaiian Sugar Planters' Association. Received August 11, 1921.

"An excellent street tree which would grow well in Florida and even farther north, as it occurs as far north as Assam." (*J. F. Rock.*)

53924. DIOSCOREA ESCULENTA (Lour.) Burkill. Dioscoreaceæ. **Lesser yam.**

From Barbados, British West Indies. Tubers presented by J. R. Bovell, Director of Agriculture. Received August 1, 1921.

"This *Buck* yam has a delicious flavor, and persons growing yams would be well advised to try to obtain a few tubers when the next planting season comes around." (*Report of Department of Agriculture, Barbados, 1919–20.*)

"This is a white-fleshed yam of excellent quality. The skin is smooth and thin but tough; the variety should be a good shipper. The tubers are cylindrical in shape and rather small." (*R. A. Young.*)

53925. DIOSCOREA LATIFOLIA Benth. Dioscoreaceæ. **Acom.**

From Buenos Aires, Argentina. Tubers presented by D. S. Bullock, agricultural trade commissioner, United States Department of Agriculture, American Embassy. Received July 28, 1921.

"*Papa de aire en parral* (climbing air potato)." (*Bullock.*)

"A yam which produces its crop of edible tubers along the vine, in the axils of the leaves instead of under ground. According to I. H. Burkill, it is of African origin and is called *acom*. Mr. Burkill states that it is very closely allied to *D. bulbifera*. The vine is round stemmed and the leaves cordate. The variety is not a very strong grower. The tubers are angular, brownish gray in color, thin but tough skinned, and in form resemble the liver of fowl, whence arises the name 'turkey-liver yam' by which the variety is known in some parts of Brazil. The tubers weigh from a fraction of an ounce to as much as a pound each, depending upon age and the conditions of growth; they keep exceedingly well. The quality of the tubers is fair when they are properly prepared for the table. The cooked tubers are rather firm but mealy. Boiled in the skin the yellowish flesh is of unpleasantly strong flavor, but when the tubers are pared, cut into pieces, and boiled, the objectionable quality is removed. The boiled yam is also very good when slightly fried." (*R. A. Young.*)

53926 and 53927.

From Africa. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the Department of Agriculture. Received August, 1920, and numbered July, 1921. Quoted notes by Doctor Shantz.

53926. CROTALARIA sp. Fabaceæ.

"(No. 1186. Kisumu, Nyanza, Kenia, British East Africa. July 11, 1920.) A Crotalaria with small clustered pods."

53927. CROTALARIA sp. Fabaceæ.

"(No. 1187. Kisumu, Nyanza, Kenia, British East Africa. July 11, 1920. A Crotalaria with large bladder pods and seeds one-eighth to one-fourth of an inch across."

53928. LEPTOSPERMUM SCOPARIUM NICHOLLII (Darr.-Smith) Turrill. Myrtaceæ.

From Richmond, Victoria. Seeds presented by F. H. Baker. Received August 13, 1921.

A red-flowered variety of this very abundant tree or shrub, the beautiful colonial counterpart of the English broom, or gorse, sometimes 30 feet in height. Early voyagers and colonists sometimes used its pungent leaves in place of tea. The whole plant, including leaves, flowers, fruit, and young shoots, is highly aromatic, and the oil which it contains perhaps, in the future, will be put to some useful purpose. The wood is largely used for fences and firewood. The Maoris made use of it for their paddles and spears, and a bunch of the twigs makes an excellent broom. (Adapted from *Laing and Blackwell, Plants of New Zealand, p. 272.*)

For previous introduction, see S. P. I. No. 48168.

53929. COUEPIA sp. Rosaceæ.

From San Jose, Costa Rica. Seeds presented by Mrs. A. L. Zeledón. Received July 20, 1921.

Small South American tree bearing clusters of numerous white or cream-colored flowers. The fruits of a number of species are eaten. (Adapted from *Lindley, A Treasury of Botany, vol. 1, p. 341.*)

53930 to 53939. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

From Harbin, Manchuria, China. Seeds procured by Douglas Jenkins, American consul. Received July 22, 1921.

"A collection of soy beans from the Grace-American International Corporation." (*Jenkins.*)

For experiment by the Office of Forage-Crop Investigations.

53930. *No. 1.*
53931. *No. 2.*
53932. *No. 3.*
53933. *No. 4.*
53934. *No. 5.*
53935. *No. 6.*
53936. *No. 7.*
53937. *No. 8.*
53938. *No. 9.*
53939. *No. 10.*

53940. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

From San Bernardo, Chile. Seeds presented by Sr. Salvador Izquierdo. Received July 22, 1921.

"Seeds of the better varieties cultivated in Santa Ines. I have not observed any diseases in these varieties and they are very hardy and productive." (*Izquierdo.*)

53941 to 53943. CAPSICUM ANNUUM L. Solanaceæ.
Red pepper.

From Valencia, Spain. Seeds purchased through John R. Putnam, American consul. Received July 28, 1921. Quoted notes, except as otherwise noted, by Don Rafael Janini, agronomical engineer, Province of Valencia.

53941. "*Morron.* The variety almost universally employed for the best grades of canned peppers." (*Putnam.*)

"A rather coarse, small-bearing variety, greatly liked for export on account of the pleasing appearance of its large, long, fleshy sweet fruits, which are suitable for preserving and roasting."

53942. "*Largo.* A variety also used in certain cases for canning." (*Putnam.*)

"A red, sweet variety."

53943. "*Pimiento de Bola.* A large sweet variety." (*Putnam.*)

"A fine, sweet variety, greatly liked for preserving."

53944 to 53946.

From Kulara, North Queensland, Australia. Seeds presented by J. A. Hamilton. Received July 28, 1921.

53944. CANNA EDULIS Ker. Cannaceæ. **Edible canna.**

"A handsome red-flowered canna, 8 to 9 feet high, cultivated in Australia for its rootstocks, which yield the Queensland arrowroot of commerce and are edible and palatable when properly cooked. When boiled for 30 minutes and then mashed they are said to be a good substitute for the potato. The species is also said to outyield the potato two to one. The tops have been used as forage." (*David Fairchild.*)

For previous introduction, see S. P. I. No. 46821.

53944 to 53946—Continued.

53945. RUBUS sp. Rosaceæ. Raspberry.

"A wild ever-bearing raspberry which has an inferior but pleasant flavor." (*Hamilton.*)

53946. ZINZIBER sp. Zingiberaceæ. **Ginger.**

"A wild ginger which likes well-drained gravelly soil with plenty of humus and partial shade." (*Hamilton.*)

53947 and 53948. CHAETOCHLOA ITALICA (L.) Scribn. Poaceæ. (*Setaria italica* Beauv.) **Millet.**

From Tokyo, Japan. Seeds purchased from Dr. T. Watase, The Tokyo Plant, Seed & Implement Co. Received July 28, 1921.

"The most important species of the genus Chaetochloa. It is called millet or, to distinguish it from other kinds of millet, foxtail millet. Millet is an erect annual, 2 to 4 feet tall, with a dense bristly yellow or purple head." (*A. S. Hitchcock.*)

53947. "*Kunitomi Uruchi.*" (*Watase.*)

53948. "*Tamagawa ō nagaho. Mochi.*" (*Watase.*)

53949 and 53950. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Coimbatore, Madras, India. Cuttings presented by T. S. Venkatraman, acting government sugar-cane expert, Agricultural College. Received July 29, 1921.

"Disease-free material of varieties now growing in India, that mature there in 10 months, according to Mr. Padhye, an Indian student at the Louisiana State University, who is very enthusiastic about these canes and thought that they would be valuable here." (*W. G. Taggart, Louisiana Sugar Station.*)

53949. *Manjav.* 53950. *Striped Mauritius.*

53951 to 53954. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

From Buenos Aires, Argentina. Seeds presented by Sr. Tomás Amadeo, director general, Ministro de Agricultura de la Nació. Received July 30, 1921. Quoted notes by Sr. Amadeo.

Seeds of cultivated tomatoes for testing for resistance to leaf-spot and other diseases.

53951. "From the School of Agriculture of Mendoza."

53952. "*Tomate de Genova,* cultivated in the School of Agriculture of Casilda."

53953. "From the experimental plantation of Pureta de Diaz (Salta)."

53954. "From the School of Agriculture of Cordoba."

53955. CITRUS sp. Rutaceæ.

From Ichang, Hupeh, China. Collected by Frank N. Meyer, Agricultural Explorer of the Department of Agriculture. Received February 25, 1918. Numbered July, 1921.

"Looks like a lemon, about 2½ inches through and 3 inches long." (*W. T. Swingle.*)

53956 and 53957.

From Pretoria, Union of South Africa. Seeds presented by Dr. I. B. Pole Evans, Division of Botany. Received July 21, 1921.

53956 and 53957—Continued.

53956. PANICUM MAXIMUM Jacq. Poaceæ. **Guinea grass.**

"*Buffels grass.* An indigenous grass received from northwestern Transvaal which is highly relished by game and domestic animals." (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 50081.

53957. UROCHLOA BRACHYURA Stapf. Poaceæ. **Grass.**

"A native of northeastern Transvaal, where the seed was collected. This grass is always the one most sought after by wild game and domestic animals." (*C. V. Piper.*)

53958 to 53977.

From Tokyo, Japan. Seeds presented by Dr. M. Okada, through Dr. A. Hrdlicka, United States National Museum. Received August 5, 1921.

53958. ALLIUM FISTULOSUM L. Liliaceæ. **Welsh onion.**

Negi.

53959. BETA VULGARIS L. Chenopodiaceæ. **Beet.**

Aka tojisha (red variety).

53960. BRASSICA JUNCEA (L.) Cass. Brassicaceæ. **Chinese mustard.**

Takana.

53961. BRASSICA PEKINENSIS (Lour.) Gagn. Brassicaceæ. **Pai ts'ai.**

Shiro kekkyusai.

53962. BRASSICA sp. Brassicaceæ. **Mustard.**

Santosai (Shantung ts'ai).

53963. BRASSICA sp. Brassicaceæ. **Mustard.**

Aka kabura (red turnip).

53964. BRASSICA sp. Brassicaceæ. **Mustard.**

Midzuna (water rape).

53965. BRASSICA sp. Brassicaceæ. **Mustard.**

Okabura (large turnip).

53966. BRASSICA sp. Brassicaceæ. **Mustard.**

Shogoin kabu (turnip).

53967. CHRYSANTHEMUM CORONARIUM L. Asteraceæ.

Kikuma.

53968. CUCUMIS SATIVUS L. Cucurbitaceæ. **Cucumber.**

Sanmaime fushinashi kiuri.

53969. PHASEOLUS VULGARIS L. Fabaceæ. **Common bean.**

Sandomame.

53970. PISUM ARVENSE L. Fabaceæ. **Field pea.**

Saya endo.

53971 to 53973. RAPHANUS SATIVUS L. Brassicaceæ. **Radish.**

53971. Early nonblooming all-season radish.

53972. *Natsu daikon* (summer radish).

53973. *Nerima onagamariyiri daikon.*

53974. BRASSICA sp. Brassicaceæ. **Mustard.**

Aka daikon (red radish).

53958 to 53977—Continued.

53975 and 53976. RAPHANUS SATIVUS L. Brassicaceæ. **Radish.**

53975. *Shogoin daikon.* 53976. *Miyashige daikon.*

53977. SOLANUM MELONGENA L. Solanaceæ. **Eggplant.**

Sandowara naganasu.

53978. ORYZA SATIVA L. Poaceæ. **Rice.**

From Chefoo, Shantung, China. Seeds presented by A. Sugden, through Lester Maynard, American consul. Received August 5, 1921.

"Glutinous rice which I got about 60 miles inland, which is said to be specially good of its kind." (*Sugden.*)

53979. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.**

(*T. vulgare* Vill.)

From Chefoo, Shantung, China. Presented by A. Sugden. Received August 6, 1921.

"Shantung is a braid-producing place. The braid is made chiefly from wheat straw, and I am sending you a sample of the straw and some seeds of the wheat from which the straw is produced." (*Sugden.*)

53980. COLOCASIA ESCULENTA (L.) Schott. Araceæ. **Taro.**

From Buitenzorg, Java. Tubers presented by Dr. W. M. Docters van Leeuwen, director, Botanic Garden. Received August 8, 1921.

"The variety *Talus Ketan* is softer and esteemed more highly than the ordinary form of taro." (*Dr. J. J. Smith, acting director.*)

"A taro having petioles of an even pale green; blade shaded with lighter and darker green, without petiolar spot. The plant produces slender rhizomes which run on the surface of the ground." (*R. A. Young.*)

For previous introduction, see S. P. I. No. 21263.

53981 and 53982.

From Foochow, Fukien, China. Seeds presented by C. R. Kellogg, Fukien Christian University. Received August 11, 1921.

53981. MEDICAGO LUPULINA L. Fabaceæ.

Yellow trefoil, a native of Europe and Asia, is often called *black medic* from the fact that its seed pods when ripe are black.

In addition to supplying the soil with humus and available nitrogen for the use of succeeding crops, the green plants form an excellent cover for the otherwise bare ground during the winter, thus retarding the gullying action and erosion of the winter rains. When turned under for soil improvement, a marked effect can usually be noted in the yields of the succeeding crops. Yellow trefoil is better adapted for pasturage than for hay, owing to its tendency to lodge, even when grown in a comparatively thick stand. All kinds of stock do well on yellow-trefoil pasture, since it furnishes very nutritious grazing. (Adapted from *note by J. M. Westgate and H. S. Coe.*)

For previous introduction, see S. P. I. No. 31395.

53982. MYRICA RUBRA Sieb. and Zucc. Myricaceæ. **Yang mae.**

"The beautiful dark-purple fruits are the size of crab apples and can be eaten out of hand or made into compotes, pies, sirup, and wine. There is great variation in the habit and productivity of the trees and also in the color, size, and taste of the fruits. The trees are evergreen and thrive best in well-drained rocky terraces. The localities that will best suit them in the United States will probably be the southern sections of the Gulf Coast States and the milder parts of California. Chinese name *yang mae.*" (*F. N. Meyer.*)

For previous introduction, see S. P. I. No. 48000.

53983. SPATHODEA CAMPANULATA Beauv. Bignoniaceæ.

From Mayaguez, Porto Rico. Seeds presented by D. W. May, in charge, Agricultural Experiment Station. Received August 13, 1921.

The tropical African *fountain* or *tulip tree*, which is of medium size but occasionally reaches a height of 70 or 80 feet, bears dark-green pinnate leaves and at the ends of the branches large bright orange-red flowers with golden yellow margins. The ground beneath the trees is often thickly covered with the exceedingly striking and handsome flowers. The unopened flowers contain a quantity of water, which gives it the name *fountain tree* in India where it is cultivated as an ornamental shade tree. The whitish fluffy seeds fill a boat-shaped capsule which is 10 to 12 inches long. (Adapted from *Rock, Ornamental Trees of Hawaii, p. 193.*)

For previous introduction, see S. P. I. No. 42373.

A cluster of flowers from this tree is shown in Plate II.

53984. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

From Uitenhage, Cape Province, Union of South Africa. Seeds presented by Hugh Magennis, Doorn Koms Farm, through Fred. J. Pritchard, United States Department of Agriculture. Received August 16, 1921.

Introduced for experimental purposes.

"The wild tomato found growing in the region of Uitenhage, received from Hugh Magennis." (*Pritchard.*)

"Resistant to diseases at Uitenhage; red in color, small, round, about 1 inch in diameter; bears in clusters of 5 to 7; very fruitful, but more seed than flesh; fond of moist situations, rapid growing." (*Magennis.*)

53985. TRIFOLIUM GLOMERATUM L. Fabaceæ. **Cluster clover.**

From Melbourne, Victoria, Australia. Seeds presented by Law, Somner & Co. Received August 16, 1921.

"This clover is useful only because it grows fairly well in sour soils, low in phosphate content, when these soils first come into cultivation and before the other clovers have established themselves." (*W. J. Spafford, Superintendent of Experimental Work.*)

For previous introduction, see S. P. I. No. 53007.

53986. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Helsingfors, Finland. Seeds presented by A. F. Tigerstedt. Received August 17, 1921.

"The timothy seed used in my estate since time immemorial, the same kind that is used everywhere else here in southern Finland." (*Tigerstedt.*)

53987. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

From Aizu-Wakamatu, Japan. Seeds presented by Rev. Christopher Noss. Received August 17, 1921.

"One of the largest seeded soy beans that has yet come into the department. Very similar to the *yachi* variety from Japan." (*W. J. Morse.*)

For previous introduction, see S. P. I. No. 49834.

53988. CLITORIA TERNATEA L. Fabaceæ.

From Brooksville, Fla. Seeds sent in from the Plant Introduction Garden, Brooksville, Fla. Received August 19, 1921.

"A double-flowered form of this interesting semitropical vine. The pea-shaped flowers are produced in the axils of the leaves and are of a beautiful deep-blue color. It is one of the most attractive of the smaller flowering vines." (*Peter Bisset.*)

For previous introduction, see S. P. I. No. 51924.

53989. Catalpa bungei Meyer. Bignoniaceæ.

From Nanking, Kiangsu, China. Seeds presented by J. L. Buck, acting dean, College of Agriculture and Forestry, University of Nanking. Received August 17, 1921.

"Seeds collected in the first Kiangsu Provincial Forest Station, Ming Tomb, Nanking. A tree with white pink-dotted flowers which are edible when cooked. The bark and leaves are used in medicine. The soft, light wood is easily split when newly cut, but durable when thoroughly dried; it is used mostly for building purposes and for making furniture, carts, coffins, window sashes, and for carving. It would probably be valuable for fence posts." (*Buck.*)

53990 to 53995.

From Ecuador. Collected by Wilson Popenoe, Agricultural Explorer of the Department of Agriculture. Received August 15, 1921. Quoted notes by Mr. Popenoe.

53990. Ananas sativus Schult. f. Bromeliaceæ. **Pineapple.**

"(No. 641. Milagro, near Guayaquil, Ecuador. July 20, 1921.) *Milagro* pineapple. Plants from the Hacienda Valdez, near Milagro, about 35 kilometers from Guayaquil.

"The pineapples of Guayaquil have long been famous in tropical America for their superior quality. They are cultivated commercially in the vicinity of Milagro, whence they are brought to the port in large quantities. A few are sent down the coast to Peru. As far as I can see, the variety is either *Smooth Cayenne* or very close to it; on the chance that it is not identical I am sending these suckers, which should be tested in Hawaii and Porto Rico.

"The plant is vigorous, with smooth leaves reaching up to 3 feet in length. The fruits, which sometimes weigh as much as 8 or 10 pounds but more commonly do not exceed 4 pounds, are oblong to oblong-oval in form, slightly narrower toward the apex than at the base. When ripe they are green on the surface; the flesh is white, very abundantly juicy, of tender, melting texture, and of delicately aromatic, sweet, very agreeable flavor. This is an excellent pineapple for use as a dessert fruit. I am inclined to think that it may prove to have slightly better shipping qualities than the strain of *Smooth Cayenne* which has been grown in Florida."

53991. Fuchsia sp. Onagraceæ.

"(No. 637a. From La Rinconada, Ecuador. June 10, 1921.) Seeds of *Zarcillejo*. A half-climbing wild shrub from the mountains of Carchi Province, where it grows at altitudes of 10,000 to 12,000 feet. It bears handsome scarlet flowers about 2 inches long and should be sufficiently hardy for cultivation in California."

53992. Salvia sagittata Ruiz and Pav. Menthaceæ. **Sage.**

"(No. 636a. Road between Cayambe and Ibarra, Ecuador. May 20, 1921.) Seeds of a handsome blue-flowered salvia from the road in the mountains between Cayambe and Ibarra in northern Ecuador, where it grows abundantly at altitudes of 8,000 to 9,000 feet. The plant is slender and reaches 3 feet in height; the deep-blue flowers, about 1½ inches long, are produced in considerable numbers and make the species worthy of a trial in the United States."

53993. Solanum brevifolium Humb. and Bonpl. Solanaceæ.

"(No. 639a. From La Rinconada, Ecuador. June 5, 1921.) Seeds of a slender, attractive climbing plant from the high páramo near the Hacienda La Rinconada, in the Province of Carchi, where it grows at altitudes of 10,000 to 12,000 feet. Its leaves are small and abundantly produced; the flowers are white, star shaped, half an inch broad, and are followed by roundish, deep orange-colored fruits up to an inch long. The slender stems send out adventitious roots, which enable them to cling with security to tree trunks and large rocks. The species may be useful in California and Florida to cover walls and fences. It is a

53990 to 53995—Continued.

perennial, and while not a large grower, will probably reach a height of 10 feet at least. Since it grows upon the high páramo, it should withstand at least several degrees of frost."

53994. RIBES PUNCTATUM Ruiz and Pav. Grossulariaceæ. **Currant.**

"(No. 638a. Hacienda La Rinconada, Ecuador. June 5, 1921.) Seeds of the wild Andean currant from the Province of Carchi. Altitude about 11,500 feet.

"A shrub reaching a height of 6 feet, with broadly ovate, subcrenate leaves truncate at the base, serrate and sometimes slightly lobed, and about an inch long. The round orange-yellow fruits, rarely more than a quarter of an inch in diameter, are borne on axillary racemes about 2 inches long. They are subacid and not very agreeable in flavor and little used by the inhabitants of the region in which they grow.

"In general appearance, both of plant and fruit, this species is strikingly suggestive of our cultivated currants. It will be of interest in the United States because of its relationship with the latter, and it may perhaps be used in producing a good variety of currant suitable for regions where our present cultivated sorts will not succeed."

A fruiting branch of this Andean currant is shown in Plate III.

53995. RUBUS ADENOTRICHOS Schlecht. Rosaceæ. **Blackberry.**

"(No. 640a. Hacienda La Rinconada, Ecuador. June 10, 1921.) *Mora blanca* (white blackberry), from the Province of Carchi, at an altitude of about 10,500 feet. This species of Rubus is low growing and half shrubby in habit, sending up canes to a height of 6 or 8 feet. The stems are light green and covered with short stiff hairs; the leaves are composed of 5 ovate-acuminate to oblong-acuminate, finely serrate, glabrate leaflets 3 to 4 inches long. The white flowers, about an inch broad, are borne in many-flowered panicles up to a foot long. The fruits are abundantly produced; they are oblong to oval, up to three-quarters of an inch long, and cream white when ripe. The drupelets are small and numerous and closely set together; the seeds are small and give little trouble when the fruit is eaten. The flavor of this excellent berry is sweet and pleasant; the species, in fact, is one of the most interesting and promising of all those which have been collected in South America up to the present time. It should be given a careful trial in the southern and western portions of the United States."

53996. DIOSCOREA TRIFIDA L. f. Dioscoreaceæ. **Yampi.**

From Porto Rico. Tuber presented by J. A. McCutcheon, Federal Horticultural Board, New York City, who obtained it from the Bean Trading Co. Received September 3, 1921.

"This is apparently a purple-skinned strain of the Jamaica yampi. The single tuber received was about 7 inches long by 3 inches in greatest diameter, and nearly 1½ pounds in weight. The flesh is rather moist when cooked, of good flavor, fine grained, and perfectly white." (*R. A. Young.*)

53997 to 54016. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Passoeroean, Java. Seeds presented by Dr. Ph. van Harreveld, director, Sugar Experiment Station. Received August 6, 1921. Quoted notes by Doctor van Harreveld.

"*POJ* is 'Proefstation, Oost Java' (Experiment Station, East Java), where all the seedlings mentioned originated."

53997 to 54003. "These crossings, types, and their seedlings are tolerant to the mosaic disease."

53997. "*No. 1376 POJ* (crossing of *Chunnee* seedlings) = *213 POJ* × *369 POJ* = (*Black Cheribon* × *Chunnee*) × (*Black Borneo* × *Chunnee*) made at the station in 1906."

53997 to 54016—Continued.

53998. "*No. 1507 POJ* (crossing of *Chunnee* seedlings)=*213 POJ*×*369 POJ*=(*Black Cheribon*×*Chunnee*)×(*Black Borneo*×*Chunnee*) made at the station in 1907."

53999. "*No. 2631 POJ* (direct *Chunnee* seedling)=*Koesoemo*×*Chunnee*, made at the station in 1914."

54000. "*No. 1410 POJ* (direct *Chunnee* seedling)=*Black Cheribon*×*Chunnee*, made at the station in 1907."

54001. "*No. 920 POJ* (direct *Chunnee* seedling)=*Black Cheribon*×*Chunnee*, made at the station in 1905."

54002. "*Chunnee*, British India, imported in 1895."

54003. "*Zwinga*, Florida, imported in 1918."

54004. "*No. 2690 POJ* (cross between *Kassoer*,[2] and *Chunnee* seedlings)=*2366*×*2011*=(*100*×*Kassoer*)×(*213 POJ*×*369 POJ*), obtained in 1916."

54005. "*No. 2655 POJ* (diluted *Kassoer* seedlings)=*2221 POJ*×*EK 28*=(*Cheribon*× *Kassoer*)×*EK 28*. These seedlings are to a slight degree attacked by the yellow-stripe disease, but are of vigorous growth and are planted with good results in the factory fields."

54006. "*Yontanzan*, Formosa, imported in 1915. The adult canes and also the seedlings are tolerant to the mosaic disease."

54007 to 54009. "(Direct crossing with *Kassoer* type) *Black Cheribon* × *Kassoer*, obtained in 1911. Resistant to the yellow-stripe disease, but too slender for cane culture."

54007. "*No. 2182 POJ.*"

54008. "*No. 2206 POJ.*"

54009. "*No. 2210 POJ.*"

54010. "*No. 1499 POJ* (crossing of *Chunnee* seedlings)=*385 POJ*×*181 POJ*=(*100 POJ*×*Chunnee*)×(*Black Cheribon*×*Chunnee*) made at the station in 1907. The adult canes and also the seedlings are tolerant to the mosaic disease."

54011. "*No. 1984 POJ* (crossing of *Chunnee* seedlings)=*213 POJ* ×*369 POJ*=(*Black Cheribon*×*Chunnee*)×(*Black Borneo*×*Chunnee*). Made at the station in 1909. The adult canes and also the seedlings are tolerant to the mosaic disease."

54012 and 54013. (Direct crossing with the *Kassoer* type) *100 POJ* ×*Kassoer*, obtained in 1911. Resistant to the yellow-stripe disease, but too slender for cane culture."

54012. "*No. 2336 POJ.*"

54013. "*No. 2366 POJ.*"

54014. "*No. 2688 POJ* (crossing between *Kassoer* and *Chunnee* seedlings)=*2366*×*2011*=(*100*×*Kassoer*)×(*213 POJ*×*369 POJ*), obtained in 1916. This type shows immunity to the yellow-stripe disease, but is too slender for cane culture."

54015. "*No. 2367 POJ* (direct crossing with *Kassoer* type)=*100 POJ*×*Kassoer*, obtained in 1911. Resistant to the yellow-stripe disease, but too slender for cane culture."

54016. "*No. 2233 POJ* (direct crossing with the *Kassoer* type)=*Black Cheribon*×*Kassoer*, obtained in 1911. Resistant to the yellow-stripe disease, but too slender for cane culture."

[2] "*Kassoer* is a cane found by Doctor Kruger in a wild state on Mount Tjerimai in Java. This type is a spontaneous crossing of the wild *Saccharum spontaneum*; *S. officinarum* seedlings, obtained at our station by crossing the two botanical species, are of the same particular habit. All the types obtained are immune against the yellow-stripe disease. All seedlings got from *S. officinarum* are tolerant to the yellow-stripe disease."



A FRUITING BRANCH OF THE ANDEAN CURRANT. (RIBES PUNCTATUM RUIZ AND PAV., S. P. I. No. 53994.)

This wild currant from the high Andes of Ecuador is not of great economic value, but when crossed with the cultivated currants of northern countries it may yield new forms whose climatic requirements will be different from those of present-day horticultural varieties. The Andean currant bears golden-yellow fruits in great abundance and grows in cool regions subject to heavy rainfall. (Photographed by Wilson Popenoe, Hacienda La Rinconada, Ecuador, June 8, 1921; P18600FS.)



THE HUANTUC, A FAVORITE ORNAMENTAL PLANT OF THE QUICHUA INDIANS. (DATURA ROSEI SAFFORD, S. P. I. No. 54049.)

Since prehistoric days the aboriginal inhabitants of the Andean region have cultivated the Huantuc about their diminutive homes. The flower, which was a great favorite with the Incas, varies in color from rich yellow to deep red, and it sometimes reaches 8 inches in length. The plant grows to 15 or 18 feet in height and blooms profusely during most of the year. It can be cultivated in subtropical regions such as California and Florida. (Photographed by Wilson Popenoe, Hacienda La Rinconada, Ecuador, June 9, 1921; P18603FS.)

54017. ATTALEA COHUNE Mart. Phœnicaceæ. **Cohune palm.**

From Stann Creek, British Honduras. Seeds presented by J. M. Sutton, Washington, D. C., who obtained them from Maxwell Riddle, American Palm Products Co., Ravenna, Ohio. Received August 11, 1921.

The fruit of this palm contains a kernel which yields about 40 per cent of an oil that is said to be superior to coconut oil. The cohune grows in the region between southern Mexico and Colombia and attains its best development in British Honduras, Guatemala, and the Honduras Republic. In the latter country the soil of the forests is rich, marly, and of excellent quality. The trees grow about 5 yards apart and the fruits form enormous bunches which sometimes weigh as much as 165 pounds. The average yield of one tree is 1,000 nuts per annum, though some specimens will produce twice as many. By means of ether rather more than 40 per cent of oil can be extracted from the kernel; the cake contains 2.5 per cent of nitrogen and can be used as cattle food. Cohune oil saponifies easily and furnishes an odorless soap which may prove to be useful in the manufacture of fine soap. When freed from fiber the fruit is 2 to 2½ inches long and about 1½ inches across. The shell is very hard and is about one-fourth of an inch thick, while the kernel is the size of a large nutmeg. Houses are thatched with the leaves of this palm; the leafstalks are woven with osiers and cord into fences and mats; the pith of the central stem can be used instead of cork for mounting insects; cord and hammocks are made from the fibers of the young leaves. The sap makes a refreshing drink. (Adapted from *La Hacienda, vol. 11, pp. 376–379.*)

54018 to 54027. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Passoeroean, Java. Cuttings presented by Dr. Ph. van Harreveld, director, Sugar Experiment Station. Received August 24, 1921. Quoted notes by Doctor van Harreveld.

"Free from yellow-stripe disease and sereh disease."

54018. "*No. 36 POJ.*"
54019. "*No. 100 POJ.*"
54020. "*No. 139 POJ.*"
54021. "*No. 213 POJ.*"
54022. "*No. 228 POJ.*"
54023. "*No. 862 POJ.*"
54024. "*No. 979 POJ.*"
54025. "*No. 1228 POJ.*"
54026. "*No. 2379 POJ.*"
54027. "*Kassoer.*"

54028. PRUNUS GLANDULOSA Thunb. Amygdalaceæ. **Plum.**

From Rochester, N. Y. Seeds presented by John Dunbar, assistant superintendent, Department of Parks. Received August 26, 1921.

"A spreading shrub with many slender twigs, growing to a height of 3 to 5 feet; it flowers early in spring with a multitude of small rosy white flowers, which are followed by an abundance of small fruits of purple-black color and of fresh sour taste. These tiny cherries make excellent preserves. Chinese name, *gai yuen tao* (dwarf diminutive peach)." (*F. N. Meyer.*)

For previous introduction, see S. P. I. No. 46003.

54029 to 54031. TRITICUM AESTIVUM L. Poaceæ. (*T. vulgare* Vill.) **Common [wheat.**

From Buenos Aires, Argentina. Seeds presented by Sr. Carlos D. Girola, Director Honorario del Museo Agrícola de la Sociedad Rural. Received August 30, 1921. Quoted notes by Sr. Girola.

54029. "*Universal* (*Triticum sativum* L. var. *aristatum* subvar. *universal* Gir.), from Baigorrita in the Province of Buenos Aires."

54030. "*Barleta,* from Médanos in the Province of Buenos Aires."

54031. "*Favorito* (*Triticum sativum* L. var. *muticum* subvar. *favorito* Gir.), from Baigorrita in the Province of Buenos Aires."

54032. Trifolium panormitanum Presl. Fabaceæ.

Sicilian clover.

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received July 14, 1921.

"A fine winter forage plant of our humid prairies; it will be interesting to carry on crosses with *Trifolium alexandrinum* or berseem. This Trifolium is a relative of berseem and resembles it very much. I believe it to be a plant capable of domestication by selection and cultivation." (*Trabut.*)

For previous introduction, see S. P. I. No. 47597.

54033. Ormosia hosiei Hemsl. and Wils. Fabaceæ.

From Chungking, Szechwan, China. Seeds presented by P. R. Josselyn, American consul. Received August 12, 1921.

"The seeds were secured through the kindness of friends in Chengtu." (*Josselyn.*)

"For high-grade cabinetwork, picture frames, and the very best furniture the timber most highly esteemed in Szechwan is the '*hung-tou mu*,' derived from *Ormosia hosiei*, a tree allied to the Sophora. In the spring *O. hosiei* produces large panicles of white and pink pea-shaped flowers, and at all seasons of the year it is a striking tree. The wood is heavier than water, of a rich-red color, and beautifully marked. It is the most high priced of all local timbers and is now very scarce. In north-central Szechwan it is still fairly common, but on the Chengtu plain it is found only in temple grounds or over shrines. The native name signifies 'red-bean tree' the seeds being red and contained in beanlike pods." (*Wilson, A Naturalist in Western China, vol. 2, p. 21.*)

54034. Passiflora macrocarpa Masters. Passifloraceæ.

From Santiago de las Vegas, Cuba. Seeds presented by Dr. Mario Calvino, director, Estación Experimental Agronómica. Received September 1, 1921.

A Brazilian plant with a habit of growth almost like that of *Passiflora quadrangularis*, from which it differs in its rounded leaves, 5 to 6 inches long, heart-shaped at the base and short acuminate at the tip, stipules up to 2 inches long, and leafy bracts 1½ inches wide and an inch long. The short, fleshy flower tube bears violet petals.

The broad, even, dark-violet coronal filaments are red spotted, the large 3-lobed stigma is yellowish, and the styles white. The fruit is 8 to 9 inches long and 5 to 6 inches in diameter, the largest fruit of all Passifloras. (Adapted from *Martius, Flora Brasiliensis, vol. 13, pt. 1, p. 597.*)

54035. Passiflora ligularis Juss. Passifloraceæ.

From Guayaquil, Ecuador. Seed collected by Wilson Popenoe, Agricultural Explorer of the Department of Agriculture. Received July 2, 1921.

"A species of Passiflora cultivated in the highlands of Guatemala, up to altitudes of 5,000 feet or more. The fruit is the size of a hen's egg, orange-yellow when fully ripe, with a thick brittle shell inclosing a large number of small thin seeds surrounded by white gelatinous pulp. The flavor is delicate, aromatic, almost perfumed; certainly more delicate and agreeable than most of the other Passifloras which produce edible fruits." (*Wilson Popenoe.*)

54036 and 54037. Cassia spp. Cæsalpiniaceæ.

From Bogota, Colombia. Seeds presented by Hermano Apollinaire-Marie, Institute de la Salle. Received September 1, 1921.

54036. Cassia tomentosa L. f.

"A beautiful ornamental tree of our savannas. It will grow in any region where *Eucalyptus globulus* thrives." (*Apollinaire-Marie.*)

54036 and 54037—Continued.

A shrub or small tree, 10 to 12 feet high, with oval-oblong leaves white tomentose beneath, and deep-yellow flowers.

For previous introduction, see S. P. I. No. 48595.

54037. CASSIA sp.

"A plant of very graceful habit, which will thrive well in regions suited to the cultivation of Eucalyptus." (*Apollinaire-Maric.*)

54038. IPOMOEA FICIFOLIA Lindl. Convolvulaceæ. **Morning-glory.**

From Buenos Aires, Argentina. Seeds presented by Sr. Benito Carrasco, director, Jardin Botanico. Received September 7, 1921.

"A climber bearing abundant clusters of large, handsome mauve-pink funnel-shaped flowers which hang in festoons from the trees and shrubs of Natal and Brazil. It is cultivated in Europe." (*Wood, Natal Plants, vol. 6, pl. 525.*)

For previous introduction, see S. P. I. No. 53609.

54039 and 54040. ELAEIS GUINEENSIS Jacq. Phœnicaceæ. **Oil palm.**

From Belgian Congo. Seeds presented by R. Kinds, director, First Section, Eighth Division, Ministère des Colonies. Received September 7, 1921.

54039. "Var. *Bundi* which is a round fruit with a very large kernel, very hard shell, and not very thick sarcocarp." (*Kinds.*)

For previous introduction, see S. P. I. No. 51021.

54040. "Var. *N'Sombo* with elongated fruit, medium kernel, and a sarcocarp very thick and very rich in oil. It is the best variety of the lower Congo and one of those most sought after for plantations." (*Kinds.*)

For previous introduction, see S. P. I. No. 51016.

54041. MANGIFERA INDICA L. Anacardiaceæ. **Mango.**

From Pachmarhi, Central Provinces, India. Seeds presented by the superintendent, Government Gardens, through William Bembower, Allahabad Agricultural Institute, Allahabad. Received September 16, 1921.

"Seeds of *Pachmarhi*, frost-resistant variety." (*Bembower.*)

"The Bombay mango grafts were seriously affected by frost each year when grown at Pagara. The 'khuds' and ravines of the Pachmarhi Hills are full of wild mangos, and it has now been found that if the Bombay varieties are grafted on the wild *Pachmarhi* seedlings, the resulting trees, without deteriorating in quality, are quite frost resistant, a fact which is worth noting by many growers in the Central Provinces who are troubled by the annual destruction caused by frost." (*Agricultural and Cooperative Gazette, Nagpur, vol. 9, p. 15.*)

54042. HIPPEASTRUM RUTILUM (Edwards) Herb. Amaryllidaceæ.

From Berlin, Germany. Bulbs presented by Wilhelm Sturz. Received July 5, 1921.

"A good window plant, flowering easily every year in living rooms, often with two scapes of four or more light vermilion-colored flowers each. There are about 50 bulbs of hazelnut size (the mother plant had about 100). These bulbs are extremely self-willed and ought not to be coaxed by great warmth; they start when they choose. Sometimes a bulb of pea size will work up through 3 inches of heavy soil, and again 120 to 130 fair-sized bulbs, like those I send, will remain dormant for one or two years under the mother plant. Thus it happened that they have been inadvertently scattered all over a place, coming up everywhere to the surprise of the gardener." (*Sturz.*)

54043. CARISSA CARANDAS L. Apocynaceæ. **Karanda.**

From Poona, Bombay, India. Seeds presented by William Burns, economic botanist to the Government of Bombay. Received July 9, 1921.

A large spiny evergreen shrub with light-gray scaly bark, elliptic leathery shining leaves 1½ to 3 inches long, and clusters of white funnel-shaped flowers half an inch long. The ellipsoid purplish black edible fruits, which are eaten out of hand and are also made into an excellent jelly for tarts, are largely sold in the native markets in the Konkan, Deccan, and in Kanara, India. (Adapted from *Cooke, Flora of Bombay, vol. 2, p. 124.*)

For previous introduction, see S. P. I. No. 51005.

54044. THEMEDA TRIANDRA *Forsk.* Poaceæ. **Kangaroo grass.**
(*T. forskallii* Hack.)

From Hobart, Tasmania. Seeds presented by F. R. Evans, Director of Agriculture, Agricultural and Stock Department. Received July 27, 1921.

One of the most useful fodder grasses of the veldt as well as one of the commonest. It is a good hay grass and relished by stock, but should be cut before the seed heads turn brown. In the condition in which it is usually cut for hay in March it has but little feeding value. (Adapted from *Kew Bulletin of Miscellaneous Information, 1911, p. 159.*)

54045. DENDROCALAMUS LONGISPATHUS Kurz. Poaceæ. **Bamboo.**

From Dehra Dun, India. Seeds presented by R. S. Hole, forest botanist, Forest Research Institute and College. Received July 29, 1921.

A tufted bamboo which flowers frequently, with culms 60 feet high, glaucous or nearly white when young, the internodes 18 to 30 inches long, 3 to 5 inches in diameter, and with walls one-third of an inch thick. The stem sheaths are densely clothed with dark stinging hairs. The oblong to linear-lanceolate leaves are rough and almost white beneath, and the panicles are large and leafy. Native to Silhet, Chittagong, Arracan, and Burma. (Adapted from *Brandis, Indian Trees, p. 677*, and *Hooker, Flora of British India, vol. 7, p. 407.*)

54046. CASIMIROA sp. Rutaceæ. **White sapote.**

From Los Angeles, Calif. Cuttings presented by Milo Baker. Received July 16, 1921.

"Budwood from a tree grown from a cutting received from Central America some years ago and budded into a white-sapote tree. The fruit is practically seedless and about the size of a small apple; the entire fruit is edible and very rich. The tree seems to be a vigorous grower and a prolific fruiter." (*Baker.*)

54047. DIOSPYROS LYCOPERSICON Carr. Diospyraceæ.

From Paris, France. Seeds presented by Dr. D. Bois, Paris Museum of Natural History. Received July 13, 1921.

"The species name, *lycopersicon*, refers to the appearance of the fruits, which exactly resemble those of the common tomato (*Solanum lycopersicon*). It is a remarkable species, not only very ornamental but also valuable for the excellent quality of the fruits, which are the largest and most beautiful known to us. It is originally from Japan, whence, it appears, scions were brought by a physician who sent them to his friend, M. Geny, then director of the Jardin de Nice, who grafted them in his garden at Saint Roch." (*Revue Horticole, vol. 50, p. 470.*)

We believe that this is merely a form of *Diospyros kaki*, but it needs to be grown before a definite decision can be made.

54048. DIOSCOREA BATATAS Decaisne. Dioscoreaceæ. **Yam.**

From Hereford, England. Tubers presented by Dr. H. E. Durham, "Dunelm." Received July 23, 1921.

Chappellier. The tubers are club shaped, tapering to a finger size at the upper part, and when grown in the open are generally about 9 to 10 inches long and weigh 12 to 14 ounces when fully grown. Occasionally twin tubers develop on a single plant, but they are then of medium size. This yam may be multiplied either by means of cuttings of the tuber or by means of bulbils. The size of the eventual tuber seems to depend a good deal on the size of the piece from which the plant was grown. By far the most important mode of multiplication is by bulbils. (Adapted from *The Hardy Yams*, by *Dr. H. E. Durham*, in *The Gardeners' Chronicle, 3d ser., vol. 69, p. 18.*)

"The stem of the vine is roundish; the leaf blade is heart-shaped, smooth, upper surface shining, with reddish purple at base of blade." (*R. A. Young.*)

54049. Datura rosei Safford. Solanaceæ.

From Ibarra, Ecuador. Seeds collected by Wilson Popenoe, Agricultural Explorer of the Department of Agriculture. Received July 21, 1921.

"(No. 625a. Hacienda La Rinconada, Ecuador. June 13, 1921.) *Huantuc.* A yellow-flowered form of the common arborescent Datura which is cultivated about the huts of the Indians all through the Ecuadorian highlands. The plant sometimes grows to 15 or 18 feet; its tubular flowers are about 6 inches long, 2 inches broad at the mouth, and of a rich deep-yellow color. The plant is worthy of trial as an ornamental in protected situations throughout southern California and in southern Florida." (*Popenoe.*)

A cluster of the tubular flowers and a fruit of this arborescent Datura are shown in Plate IV.

54050 to 54053.

From San Jose, Costa Rica. Seeds presented by Carlos Wercklé. Received July 16, 1921. Quoted notes by Mr. Wercklé except as otherwise stated.

54050. Couepia floccosa Fritsch. Rosaceæ.

"*Olosapo, sapotilla de olor.*"

A stout-branched, hoary Guatemalan plant with elliptic to obtuse leaves 1 to 4 inches long, cobwebby above when young, and white tomentose beneath. The small flowers in short reddish tomentose panicles are followed by villose fruits. (Adapted from *Fritsch, Beitrage zur Kenntniss der Chrysobalanaceen, II.* In *Annalen des K. K. Naturhistorischen Hofmuseums, vol. 5, p. 12.*)

54051. Casimiroa edulis La Llave. Rutaceæ. **White sapote.**

"The largest variety that I know; the fruit is very good and weighs from 1 to 1½ pounds."

"A medium-sized erect or spreading tree, having palmately compound leaves, small inconspicuous flowers, and yellowish green fruits the size of an orange. The fruits have a thin membranous skin, yellowish flesh of soft melting texture and sweet or slightly bitter flavor, and one to five large oval or elliptic seeds.

"In its native region the white sapote is a fruit of the highlands. Throughout Mexico and Guatemala it is found at altitudes of 2,000 to 3,000 feet, and occasionally as high as 9,000 feet. It is not grown in regions subject to heavy rainfall." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 47565.

54052. Rheedia edulis (Seem.) Planch. and Triana. Clusiaceæ.

"A handsome pyramidal tree 20 to 25 feet high with deep-green glossy oblong-lanceolate leaves 4 to 6 inches long. The elliptic bright orange-yellow fruits 2 inches long and 1½ inches in diameter have thick terebinthinous skin which separates easily from the snowy white, juicy, melting pulp. The flavor is acid unless the fruit is almost overripe, and strongly resembles that of *Lansium domesticum*. The one to three seeds are about an inch long and adhere closely to the pulp; when cut

54050 to 54053—Continued.

a yellow gamboge oozes out of them. Natives are very fond of this fruit, but the Americans in Brazil do not care for it. It is said to make a superior *doce*, or preserve." (*P. H. Dorsett.*)

For previous introduction, see S. P. I. No. 37384.

54053. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

"A native wild bean of the *lunatus* type."

54054 to 54057. DIOSCOREA spp. Dioscoreaceæ.

From Port of Spain, Trinidad. Tubers presented by C. Connell, Montrose, Arima, Trinidad, through F. W. Urich, entomologist, Department of Agriculture, St. Clair Experiment Station. Received July 19, 1921. Quoted notes by Mr. Urich except as otherwise noted.

54054. DIOSCOREA LATIFOLIA Benth. **Acom.**

"*St. Vincent.* The yam bears external tubers on the vine. Cook like the ordinary potato, and in planting treat in the same way as the potato."

"A yam which bears medium-sized, angular edible aerial tubers having yellowish flesh of fair quality. The vine is round stemmed and the leaf is cordate with a broad sinus and abruptly long-acuminate. I. H. Burkill, of the Singapore Botanic Garden, states that this species is native to Africa, where it is called *acom*. The variety is apparently identical with the *caissara*, or 'turkey-liver' yam, of Brazil, the 'Carib potato' of Nicaragua, and the 'climbing air-potato' of Argentina." (*R. A. Young.*)

54055. DIOSCOREA ESCULENTA (Lour.) Burkill. **Lesser yam.**

"*Chinese.*"

"A yam with small, somewhat cylindrical tubers with a smooth tough skin and white flesh of excellent quality. The vine is round stemmed and bears a few short spines. The leaf is cordate with a narrow sinus." (*R. A. Young.*)

54056. DIOSCOREA TRIFIDA L. **Yampi.**

"*Couche Couche.* Grows well in sandy soil."

"Var. *Trinidad yampi*, or *cush-cush*. A small-tubered yam with pink skin and flesh which is usually white and somewhat sweet. The quality is very good. The stem of the vine is two winged, and the leaf is three lobed." (*R. A. Young.*)

For previous introduction, see S. P. I. No. 45992.

54057. DIOSCOREA ALATA L. **Greater yam.**

"*Coconut.*"

"A white-fleshed yam of fair size and good quality." (*R. A. Young.*)

For previous introduction, see S. P. I. No. 49825.

54058. LONICERA SYRINGANTHA Maxim. Caprifoliaceæ. **Honeysuckle.**

From Elstree, Herts, England. Seeds presented by Hon. Vicary Gibbs. Received July 26, 1921.

"Possibly the most beautiful of the bush honeysuckles; a low spreading bush from 2 to 4 feet high, with bluish green leaves and large pink Daphnelike blossoms one-fourth of an inch across of firm waxy texture and a fragrance strongly reminiscent of *Daphne cneorum*, also of hyacinths, but more powerful and delicious." (*The Garden, vol. 85, p. 225.*)

54059. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From Lumbatan, Lanao, Mindanao, Philippine Islands. Tubers presented by G. O. Risinger, supervising teacher, Camp Keithley, through P. J. Wester, director, Lamao Experiment Station, Lamao, Bataan. Received July 7, 1921.

"Our smallest Irish potatoes, grown at the Lumbatan Agricultural School, Lanao, at an altitude of 2,500 feet." (*Risinger.*)

54060. SOLANUM sp. Solanaceæ. **Potato.**

From Ibarra, Ecuador. Tubers collected by Wilson Popenoe, Agricultural Explorer of the Department of Agriculture. Received July 21, 1921.

"(No. 620. Hacienda La Rinconada, in the Province of Carchi. June 9, 1921.) A true wild potato, growing at an altitude of 11,500 feet. It grows abundantly in certain places, preferring the protection of shrubby vegetation along ravines on the páramo. The tubers are rarely more than an inch long by half an inch in thickness, and they are whitish brown with white flesh. They are not used by the inhabitants of this region. The plants appear to be attacked by late-blight, as are cultivated potatoes in the same region." (*Popenoe.*)

54061 to 54163.

From Arnold Arboretum, Jamaica Plain, Mass. Seeds collected by H. C. Skeels, of the Office of Foreign Seed and Plant Introduction, for use in breeding experiments by experts of the Department of Agriculture. Numbered September, 1921. Quoted notes by Mr. Skeels.

54061 to 54074. BERBERIS spp. Berberidaceæ. **Barberry.**

54061. BERBERIS AGGREGATA C. Schneid.

"(Arboretum No. 6861; Wilson No. 1050.) A Chinese shrub 3 to 5 feet high, which has yellowish brown spines, small oblong leaves, yellow flowers in dense racemes, and salmon-red fruits."

For previous introduction, see S. P. I. No. 43817.

54062. BERBERIS AMURENSIS Rupr.

"This northern Chinese and Manchurian shrub, often 8 feet high, has gray branches, slightly reticulated oblong leaves 1 to 3 inches long, and racemes of 8 to 12 ovoid scarlet berries."

For previous introduction, see S. P. I. No. 49052.

54063. BERBERIS AMURENSIS JAPONICA (Regel) Rehder.

"A stout compact shrub native to Japan, with leaves obovate and more leathery than in *B. amurensis.* The scarlet berries have a slight bloom."

For previous introduction, see S. P. I. No. 49053.

54064. BERBERIS BRACHYPODA Maxim.

"(Arboretum No. 7175; Wilson No. 554a.) A shrub from western China 4 to 7 feet high, with ovate serrate leaves, long slender panicles of yellow flowers, and scarlet fruits often half an inch in diameter."

For previous introduction, see S. P. I. No. 43818.

54065. BERBERIS DICTYOPHYLLA Franch.

"A native of Yunnan, China, this barberry is a medium-sized shrub, often broader than high, with small ovate leaves in clusters, pale-yellow flowers, and ovoid red fruits."

For previous introduction, see S. P. I. No. 49056.

54061 to 54163—Continued.

54066. BERBERIS DIELSIANA Fedde.

"(Purdom No. 605a.) A spreading, loosely branched Chinese shrub often 10 feet high, with elliptic leaves that are whitish beneath. The beauty of the red fruits is accentuated by the bronzy color of the leaves in the fall."

For previous introduction, see S. P. I. No. 49057.

54067. BERBERIS GILGIANA Fedde.

"(Arboretum No. 7283; Purdom No. 589.) A native of central China, this ashy barked shrub has somewhat coriaceous lanceolate leaves and dense racemes of yellow flowers."

For previous introduction, see S. P. I. No. 49058.

54068. BERBERIS HENRYANA C. Schneid.

"A Chinese shrub resembling the common barberry, *B. vulgaris*, but having purplish or brown branches. It is about 8 feet high with membranous elliptical leaves pale beneath, and racemes of 10 to 20 yellow flowers followed by red fruits."

For previous introduction, see S. P. I. No. 49059.

54069. BERBERIS KOREANA Palibin.

"A Korean shrub often 6 feet high, with obovate leaves 2 to 3 inches long, dense lax racemes of yellow flowers, and round scarlet fruits."

For previous introduction, see S. P. I. No. 49061.

54070. BERBERIS LUCIDA Schrad.

"This shrub of unknown origin has lustrous dark-green oblong leaves and spreading red-berried racemes about 2 inches long."

For previous introduction, see S. P. I. No. 49062.

54071. BERBERIS SEROTINA Lange.

"A shrub of unknown origin with oblanceolate, entire light-green leaves and short dense racemes of yellow flowers and purplish fruits."

For previous introduction, see S. P. I. No. 49064.

54072. BERBERIS SIEBOLDII Miquel.

"A Japanese shrub about 3 feet high, with reddish brown branches and obovate leaves, 1 to 2 inches long, which turn deep red in the fall. The yellow flowers in small racemes are followed by bright-red fruits one-fourth of an inch long."

For previous introduction, see S. P. I. No. 13353.

54073. BERBERIS THUNBERGII MAXIMOWICZII Regel.

"A Japanese barberry which is larger than the ordinary form and has more arching branches, while the leaves are green beneath. It has the same autumn color of the leaves as the common form and larger flowers and fruits."

For previous introduction, see S. P. I. No. 49065.

54074. BERBERIS VERNAE C. Schneid.

"(Arboretum No. 7176; Wilson No. 4022.)"

A low Chinese shrub native to Kansu Province, about 4 feet high, with spatulate leaves in small fascicles and small yellow flowers followed by red globose fruits one-fourth of an inch in diameter. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 372.*)

54061 to 54163—Continued.

54075. COTONEASTER DIELSIANA E. Pritz. Malaceæ.

"(Arboretum No. 6100–2; Wilson No. 466.) A western Chinese shrub 6 feet high, with slender arching branches, firm oval leaves yellowish gray beneath, and pinkish flowers in small clusters followed by red fruits one-fourth of an inch in diameter."

For previous introduction, see S. P. I. No. 43990.

54076. COTONEASTER FOVEOLATA Rehd. and Wils. Malaceæ.

"(Arboretum No. 6589; Wilson No. 156.) A shrub from Hupeh Province, China, often 10 feet high, with spreading branches. The elliptical leaves are 2 to 3 inches long and turn bright scarlet in autumn. The small clusters of pink flowers are followed by black subglobose fruits about one-third of an inch in diameter."

For previous introduction, see S. P. I. No. 45728.

54077 to 54081. CRATAEGUS spp. Malaceæ. **Hawthorn.**

54077. CRATAEGUS ARKANSANA Sarg.

"(Arboretum No. 4177.)"

A tree native to Arkansas, 20 feet high, with oblong-ovate leaves which turn bright yellow in the fall. The white flowers, 1 inch across, are borne in many-flowered corymbs, and the bright-crimson fruits persist on the branches late in the season. (Adapted from *Sargent, Trees of North America, p. 425.*)

54078. × CRATAEGUS LAVALLEI Herincq.

"(Arboretum No. 2769.) A tree of garden origin with pure-white flowers an inch across, pink stamens, and red fruits an inch in diameter, well displayed by the rich brown leaves in autumn."

For previous introduction, see S. P. I. No. 49071.

54079. CRATAEGUS DAWSONIANA Sarg.

"(Arboretum No. 4428.) A small tree native to Illinois, with yellow-green ovate leaves and orange-red, yellow-fleshed, obovate fruits borne on long slender pedicels."

For previous introductions, see S. P. I. No. 49072.

54080. CRATAEGUS NITIDA (Engelm.) Sarg.

"(Arboretum No. 4123.) An Illinois tree often 30 feet tall, with coarsely serrate lanceolate leaves, white flowers with yellow stamens, and drooping clusters of red fruits on slender stems."

For previous introduction, see S. P. I. No. 49073.

54081. CRATAEGUS PRUNIFOLIA (Marsh.) Baumg.

"(Arboretum No. 4116–5.) A shrub or small tree with obovate serrate leaves, corymbs of white flowers with pink stamens, and red fruits. It is probably of garden origin."

54082 to 54094. MALUS spp. Malaceæ. **Crab apple.**

54082. × MALUS ARNOLDIANA Rehder.

"A hybrid of *M. floribunda* which originated in the Arboretum. The large pink flowers on long stems and the yellow fruits make this tree attractive all through the season."

For previous introduction, see S. P. I. No. 46698.

54083. MALUS BACCATA JACKII Rehder.

"(Arboretum No. 7348.)"

A handsome tree native to Korea, with pure-white flowers 1½ inches across, large dark-green leaves glaucescent beneath, and dark-red fruits nearly an inch thick. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 291.*)

54061 to 54163—Continued.

54084. MALUS IOENSIS (Wood) Britton.

"(Arboretum No. 4683.) This wild crab apple, native to the Mississippi Valley, is a tree often 30 feet h gh, with ovate serrate leaves 3 to 4 inches long which turn yellow in the fall. The rose-colored flowers, 1 to 2 inches across, are borne in small clusters and are followed by fragrant greenish yellow fruits sometimes 2 inches in diameter."

54085. MALUS MICROMALUS Makino.

"(Arboretum No. 3202–3.) A small tree possibly of hybrid origin, with erect branches forming a pyramidal head. It bears a profusion of bright-red flowers and holds its small fruits well into the winter."

For previous introduction, see S. P. I. No. 49082.

54086. MALUS PRUNIFOLIA RINKI (Koidz.) Rehder.

"A small tree native to China, with obovate leaves, pink or pinkish white flowers, and yellow edible apples often 2 inches in diameter."

For previous introduction, see S. P. I. No. 49083.

54087. × MALUS ROBUSTA Rehder.

"Seeds from several trees of this interesting hybrid between *M. baccata* and *M. prunifolia*. The flowers and fruits are quite ornamental, but the greatest value lies in the fact that Mr. Judd, the expert propagator at the Arboretum, considers this the best stock on which to graft other kinds of apples."

54088. MALUS SARGENTII Rehder.

"(Arboretum No. 4681.) A low, freely branching shrub, native to Japan, with ovate sharply serrate leaves, small clusters of pure-white flowers and dark-red fruits, which are produced very freely."

For previous introduction, see S. P. I. No. 48084.

54089. × MALUS SCHEIDECKERI Spaeth.

"(Arboretum No. 3510.) A garden hybrid one of whose parents is probably *M. floribunda;* this forms a small tree bearing semi-double pink flowers and red fruits nearly an inch in diameter."

For previous introduction, see S. P. I. No. 27126.

54090. MALUS SIEBOLDII ARBORESCENS Rehder.

"(Arboretum No. 1703.) A Japanese tree with longer leaves than the type and bearing nearly white flowers."

For previous introduction, see S. P. I. No. 49088.

54091. MALUS THEIFERA Rehder.

"(Arboretum No. 7241; Wilson No. 451.) This small stiff-branched tree, native to China, bears fragrant white flowers and globose yellow fruits with red cheeks."

For previous introduction, see S. P. I. No. 45681.

54092. MALUS TRANSITORIA TORINGOIDES Rehder.

"(Arboretum No. 7186.) A tree 16 to 26 feet high native to western Szechwan, China, at altitudes of 9,000 to 12,000 feet, with felted twigs. The leaves 2 inches long are more entire, and the scarlet and yellow fruits are larger, than in *M. transitoria*."

For previous introduction, see S. P. I. No. 46701.

54093 and 54094. MALUS ZUMI (Mats.) Rehder.

"(Arboretum No. 5002.) A low round-headed tree native to Japan, with oblong yellowish green leaves, and bearing a profusion of pinkish flowers and red fruits."

For previous introduction, see S. P. I. No. 43705.

54061 to 54163—Continued.

54093. "A large-fruited form."

54094. "A small-fruited form."

54095 to 54103. PYRUS spp. Malaceæ. **Pear.**

54095. PYRUS BETULAEFOLIA Bunge.

"(Arboretum No. 1699.) A tree 20 feet high, native to northern China, with round-ovate serrate leaves, crowded clusters of small flowers, and globose fruits about the size of peas."

For previous introduction, see S. P. I. No. 51883.

54096. PYRUS CALLERYANA Decaisne.

"(Arboretum No. 7203.) This Chinese tree, often 30 feet high, has crenate leaves and small flowers and fruits, the latter being globular but contracted at the base into a long slender stalk."

For previous introduction, see S. P. I. No. 49862.

54097. PYRUS CALLERYANA GRACILIFLORA Rehder.

"(Arboretum No. 1078.) A form of Callery's pear which has looser and more slender flower clusters and pink anthers instead of the purple ones of the type."

For previous introduction, see S. P. I. No. 49098.

54098. PYRUS CALLERYANA TOMENTELLA Rehder.

"(Arboretum No. 1079; Wilson No. 556.) A form differing from the type in having dense white tomentum on the young growth."

For previous introduction, see S. P. I. No. 49099.

54099. × PYRUS MICHAUXII Bosc.

"(Arboretum No. 445–1.) A natural hybrid between *P. amygdaliformis* and *P. nivalis*, native to Asia Minor. The shining leaves are ovate-oblong, and the small clusters of white flowers are followed by turbinate greenish yellow fruits."

For previous introduction, see S. P. I. No. 44049.

54100. PYRUS NIVALIS Jacq.

"(Arboretum No. 3293.) This Asia Minor pear is a tree with the young shoots thickly covered with white wool. The ovate entire leaves are 3 inches long, and the conspicuous clusters of white flowers, 1 to 2 inches across, produce yellowish green fruits often 2 inches in diameter."

For previous introduction, see S. P. I. No. 51884.

54101. PYRUS PHAEOCARPA GLOBOSA Rehder.

"(Arboretum No. 1715.) A medium-sized Chinese tree with lustrous deep-green ovate leaves and unusually large white flowers. The fruits differ from those of the type in being globose instead of pear shaped."

For previous introduction, see S. P. I. No. 44045.

54102. PYRUS SALICIFOLIA Pall.

"Var. *pendula*. (Arboretum No. 169.) A pendulous form of the willow-leaved pear, native to Asia Minor, with shiny lanceolate leaves about 4 inches long, pure-white flowers in dense clusters, and small pear-shaped fruits."

For previous introduction, see S. P. I. No. 44053.

54061 to 54163—Continued.

54103. PYRUS SERRULATA Rehder.

"(Arboretum No. 7273.) A Chinese tree, often 25 feet high, with ovate serrulate leaves, small white flowers, and brown ovoid fruits about half an inch long."

For previous introduction, see S. P. I. No. 49100.

54104 to 54163. ROSA spp. Rosaceæ. **Rose.**

54104. ROSA ABIETINA Grenier.

"A Swiss rose which forms a compact shrub 5 to 7 feet high, with 5 to 9 leaflets and clusters of 6 to 8 small rosy flowers."

For previous introduction, see S. P. I. No. 43706.

54105. ROSA ACICULARIS Lindl.

"A low, densely prickly shrub native to northern America, Europe, and Asia. It bears 3 to 7 leaflets and solitary deep-rose flowers followed by pear-shaped fruits."

54106. ROSA ACICULARIS ENGELMANNII (S. Wats.) Crep. (*R. engelmannii* S. Wats.)

"Engelmann's rose, differing from the type in the distinctly doubly serrate glandular leaflets and the oblong fruits."

54107. ROSA ALBA L.

"A shrub often 6 feet high, with slightly double fragrant flowers and scarlet fruits. Probably of hybrid origin."

For previous introduction, see S. P. I. No. 49102.

54108. ROSA ALBERTI Regel.

"A slender-branched Turkestan rose with 5 to 9 leaflets and white flowers 1 to 2 inches broad."

For previous introduction, see S. P. I. No. 49103.

54109. ROSA AMBLYOTIS Meyer.

"A stout-branched shrub with purple stems, native to Siberia. The leaflets are usually seven, the pink flowers are solitary, and the fruits are about half an inch long."

For previous introduction, see S. P. I. No. 43878.

54110. ROSA ARVENSIS Huds.

"An English rose with creeping stems, seven ovate serrate leaflets, small clusters of white odorless flowers with yellow stamens, and small red fruits."

For previous introduction, see S. P. I. No. 49104.

54111. ROSA BAICALENSIS Turcz.

"A little-known Asiatic rose closely related to *R. acicularis* but kept distinct at the Arboretum."

For previous introduction, see S. P. I. No. 43708.

54112. ROSA BLANDA Ait.

"An erect shrub sometimes 6 feet high, native throughout the northern part of the United States. The large, sweet-scented, single rich-pink flowers are our earliest wild roses to bloom."

For previous introduction, see S. P. I. No. 49106.

54113. ROSA CALIFORNICA Cham. and Schlecht.

"A tall shrub often 8 feet high, native to northwestern America, with stout hooked prickles, five to nine broadly elliptic leaflets, pink flowers an inch across in dense corymbs, and ovoid fruits with a prominent neck."

54061 to 54163—Continued.

54114 to 54117. ROSA CANINA L. **Dog-rose.**

54114. "Var. *andegavensis*. A form with doubly serrate leaflets and glandular peduncles."

54115. "Var. *subinermis*. An almost thornless form."

54116. "Var. *uralensis*. A form from the Ural Mountains."

54117. Received as *R. bakeri*, which is now referred to *R. canina*.

54118. ROSA CAUDATA Baker.

"(Arboretum No. 7160; Wilson No. 306.) A tall shrub native to western China, with seven to nine oblong leaflets, red flowers 2 inches across, and oblong fruits."

For previous introduction, see S. P. I. No. 43883.

54119. ROSA CHINENSIS MANETTI Dipp.

"An upright shrub with three to seven shining leaflets and deep-pink, usually semidouble flowers. Often used as a stock."

For previous introduction, see S. P. I. No. 43711.

54120. ROSA CINNAMOMEA L.
(*R. pendulina* L.)

"An unarmed shrub, native to Europe, with seven to nine ovate leaflets, solitary pink flowers, and nodding ovate scarlet fruits."

For previous introduction, see S. P. I. No. 43712.

54121. ROSA CORIIFOLIA Fries.

"A European shrub 5 feet high, with pubescent leaflets and short-stemmed pink flowers. Received as *R. monticola*, which is now referred to *R. coriifolia*.

For previous introduction, see S. P. I. No. 49110.

54122. ROSA CUSPIDATA Bieb.

A shrub 2 to 3 feet high, native to Asia Minor, with doubly serrate leaflets, white flowers in clusters of 5 to 10, and globose bluish black fruits. (Adapted from *Bieberstein, Flora Taurico-Caucasia, vol. 1, p. 396.*)

54123. ROSA DAMASCENA Mill. **Damask rose.**

"A low shrub with numerous stout hooked prickles, five to seven ovate-oblong leaflets, and double red, pink, or white flowers in corymbose clusters."

For previous introduction, see S. P. I. No. 32950.

54124. ROSA DAVURICA Pall.

"A Manchurian shrub closely related to the cinnamon rose (*R. majalis*), with straight slender prickles, smaller doubly serrate leaflets, purple flowers, and ovate scarlet fruits."

For previous introduction, see S. P. I. No. 43887.

54125. ROSA DESEGLISEI Boreau.

A low spreading shrub with white prickles, native to central France, bearing usually five ovate, dentate, pale-green velvety leaflets, and small pink flowers singly or in pairs. (Adapted from *Boreau, Flore du Centre de la France, p. 224.*)

54126. ROSA DUMETORUM Thuill.

"A European shrub with recurved branches and stout hooked prickles. The five to seven orbicular leaflets are simply serrate and pubescent, the single pink flowers are in few-flowered clusters, and the ovoid orange-red fruits are nearly an inch long."

For previous introduction, see S. P. I. No. 49111.

54061 to 54163—Continued.

54127. ROSA FENDLERI Crep.

"A low shrub native to western North America, with straight spines, five to seven oblong-ovate, pubescent dark-green leaflets, small pink flowers, and globose fruits."

For previous introduction, see S. P. I. No. 32952.

54128. ROSA FEROX Bieb.

"This dwarf bush 1 to 2 feet high, native to Asia Minor, has five to seven coarsely serrate leaflets, white flowers in small clusters, and red globose fruits."

For previous introduction, see S. P. I. No. 43714.

54129. ROSA FOLIOLOSA Nutt.

"A low shrub native to the southwestern part of the United States, with seven to nine linear-oblong leaflets, usually solitary pink flowers, and globose fruits."

54130. ROSA GALLICA L.

"Var. *grandiflora*. A large-flowered form of this common European rose, which has three to five leathery ovate leaflets, crimson flowers 2 to 3 inches across, and turbinate brick-red fruits."

For previous introduction, see S. P. I. No. 34481.

54131. ROSA GALLICA OFFICINALIS Thory.
(*R. provincialis* Mill.)

"The Province rose is a double form of the common *R. gallica*."

54132. ROSA GAYIANA Wallr.

"A shrub native to Europe and closely allied to *R. villosa*. The leaflets are oblong-ovate, the thorns are straight, and the pink flowers are solitary."

For previous introduction, see S. P. I. No. 49112.

54133. ROSA GYMNOCARPA Nutt.

"A tall shrub sometimes 10 feet high, native to the west coast of North America. The five to nine glabrous leaflets are broadly oblong, the small solitary flowers are pale pink, and the small globose fruits are orange-red."

For previous introduction, see S. P. I. No. 25578.

54134. ROSA HELIOPHILA ALBA Rehder.

"The white-flowered form of *R. heliophila*, which is a shrub 2 feet high native to the prairies west of the Missouri River. The green stems are very prickly, the 7 to 11 simply serrate leaflets are obovate and pubescent beneath, the small pink flowers are borne in clusters and are followed by red globose fruits."

54135. ROSA JACKII Rehder.

"A procumbent shrub native to Korea, with 7 to 9 elliptical glabrous leaflets, corymbs of white flowers nearly 2 inches across, and small red ovoid fruits."

For previous introduction, see S. P. I. No. 43898.

54136. ROSA JUNDZILLI Besser.

"A central European shrub sometimes 9 feet high, with straight spines, five to seven large glabrous leaflets, small clusters of large pink flowers, and subglobose bright-red fruits."

For previous introduction, see S. P. I. No. 43717.

54137. ROSA MAJALIS Herrmann. **Cinnamon rose.**
(*R. cinnamomea* L. 1759, not 1753.)

"The well-known cinnamon rose, native to Europe, with three to seven oblong leaflets, purple flowers, and scarlet fruits."

54061 to 54163—Continued.

54138. ROSA MICRANTHA J. E. Smith.

"A shrub resembling the dog-rose and native to central Europe. The leaflets are pubescent beneath; the small pink flowers are borne in clusters, and the ovoid fruits are bright red."

For previous introduction, see S. P. I. No. 49043.

54139. ROSA MONTANA Chaix.

"Another ally of *R. canina*, with strong spines, broader leaflets tinged with red, and pale-pink flowers."

For previous introduction, see S. P. I. No. 49114.

54140. ROSA MULTIFLORA CATHAYENSIS Rehd. and Wils.

"The wild, single-flowered form of *R. multiflora*, native to China, with pink flowers instead of white as in the type."

For previous introduction, see S. P. I. No. 49115.

54141. ROSA NUTKANA Presl.

"This stout shrub native to Alaska and southward to Oregon, has five to seven broadly elliptical, double-serrate glabrous leaflets, usually solitary pink flowers nearly 3 inches across, and red globose fruits."

For previous introduction, see S. P. I. No. 49116.

54142. ROSA OXYODON Boiss.

"A Caucasian shrub with five to seven ovate leaflets and solitary pink flowers."

For previous introduction, see S. P. I. No. 49117.

54143. ROSA PALMERI Rydb.

A low shrub native to Missouri and Texas, with slender reflexed prickles, five to nine dark-green lanceolate leaflets pubescent beneath, pink flowers solitary or in small clusters, and globose glandular hispid fruits half an inch in diameter. (Adapted from *North American Flora, vol. 22, p. 502.*)

54144. ROSA PALUSTRIS Marsh.

"The common wild rose on moist land in the eastern part of the United States. The stems are often 8 feet high, with seven narrowly oblong leaflets pubescent beneath, corymbs of pink flowers, and depressed-globose hispid red fruits."

For previous introduction, see S. P. I. No. 49044.

54145. ROSA PISOCARPA A. Gray.

"A slender-stemmed shrub native to the northwest coast of America, with straight or ascending prickles, five to seven oblong leaflets, small pink flowers in dense corymbs, and globose fruits."

For previous introduction, see S. P. I. No. 30262.

54146. ROSA POUZINI Tratt.

"A southern European shrub 7 feet tall, with five to nine serrate leaflets and small pale-pink to white flowers."

For previous introduction, see S. P. I. No. 43906.

54147. ROSA RUBIGINOSA L. **Sweetbrier.**

"Var. *Carnosa.* A flesh-colored form of the sweetbrier which usually has bright-pink flowers."

54148. ROSA RUGOSA CHAMISSONIANA Meyer.

"A form of the Japanese rose with almost no bristles and with smaller, narrower, and less rugose leaflets."

54061 to 54163—Continued.

54149. ROSA RUGOSA KAMCHATICA (Vent.) Regel.

"A Kamchatcan form of the Japanese rose, with more slender and less bristly stems, thinner leaves, and smaller flowers and fruits."

For previous introduction, see S. P. I. No. 30260.

54150. ROSA SERTATA Rolfe.

"A low shrub, native to western China, with glaucous stems 5 feet high armed with straight slender prickles, 7 to 11 narrowly oblong leaflets, solitary purple flowers 2 to 3 inches across, and deep-red obovoid fruits."

For previous introduction, see S. P. I. No. 43912.

54151. ROSA SPINOSISSIMA L. **Scotch rose.**

"This low shrub native to Europe and Asia, has 5 to 11 oblong-ovate leaflets, pink, white, or yellowish flowers, and black fruits."

For previous introduction, see S. P. I. No. 43913.

54152. ROSA SPINOSISSIMA ALTAICA (Willd.) Rehder.

"This form of the Scotch rose is a native of the Altai region and is a more vigorous shrub than the type with large white flowers on smooth pedicels."

54153. ROSA SPINOSISSIMA HISPIDA (Sims) Koehne.

"A Siberian form with simply serrate leaflets and sulphur-yellow flowers 3 inches across."

For previous introduction, see S. P. I. No. 43914.

54154. ROSA STELLATA Wooton.

An upright shrub 2 feet high, native to New Mexico, with densely stellate pubescent young stems, three to five cuneate-obovate pubescent leaflets, solitary deep rose-purple flowers 2 to 3 inches across, and reddish brown prickly fruits. (Adapted from *Bulletin Torrey Botanical Club, vol. 25, p. 152.*)

54155. ROSA TUSCHETICA Boiss.

A low shrub native to the Caucasus region, with small firm ovate leaflets and solitary pink flowers. (Adapted from *Boissier, Flora Orientalis, vol. 2, p. 673.*)

54156. ROSA VILLOSA L.

"A densely branched shrub 6 feet high, native to Europe, with nearly straight spines, five to seven ovate grayish green leaflets, pink flowers in small clusters, and ovoid scarlet fruits."

For previous introduction, see S. P. I. No. 43726.

54157. ROSA VILLOSA L.

Received as *R. pomifera*, which is now referred to *R. villosa*.

54158. ROSA WOODSII Lindl.

"A slender bristly stemmed shrub 3 feet high, native to Colorado and Missouri, with five to nine obovate-oblong leaflets pubescent beneath, and small clusters of light-pink flowers 2 inches across, followed by globose fruits."

54159 to 54163. ROSA spp.

"Received under names probably of horticultural origin, for which places of publication have not yet been found."

54061 to 54163—Continued.

54159. ROSA sp.

Received as *R. chyraica.*

54160. ROSA sp.

Received as *R. coraiensis.*

54161. ROSA sp.

Received as *R. kurdestana.*

54162. ROSA sp.

Received as *R. obtusiloba.*

54163. ROSA sp.

Received as *R. urens.*

54164 to 54265.

From Highland Park, Rochester, N. Y. Seeds collected by H. C. Skeels, of the Office of Foreign Seed and Plant Introduction, to be used in stock experiments by experts of the Department of Agriculture. Numbered September, 1921. Quoted notes by Mr. Skeels, except as stated.

54164. CRATAEGUS COCCINIOIDES Ashe. Malaceæ. **Hawthorn.**

A tree 20 feet high native to Missouri, with broadly ovate serrate leaves, compact cymes of white flowers nearly an inch across, with pink stamens and dark-crimson fruits. (Adapted from *Sargent, Trees of North America, p. 458.*)

54165 to 54265. ROSA spp. Rosaceæ. **Rose.**

54165. ROSA ACICULARIS Lindl.

For previous introduction, see S. P. I. No. 54105.

54166. ROSA ACICULARIS BOURGEAUIANA Crep.
(*R. sayi* Schwein.)

"A low shrub native to Ontario and westward to Colorado, with three to seven narrowly oblong leaflets, differing from the type in having larger deep-rose flowers nearly 3 inches across and globose fruits."

54167. ROSA ACICULARIS ENGELMANNII (S. Wats.) Crep.
(*R. engelmannii* S. Wats.)

For previous introduction, see S. P. I. No. 54106.

54168. ROSA ACICULARIS GMELINI (Bunge) C. Schneid.
(*R. carelica* Fries.)

A form native to northern Europe and Asia, differing from the type in having five to seven leaflets on the flowering branches, smooth but glandular peduncles, and long pear-shaped shining fruits. (Adapted from *Schneider, Illustriertes Handbuch der Laubholzkunde, vol. 1, p. 582.*)

54169. ROSA ACICULARIS NIPPONENSIS (Crep.) Koehne.

"A Japanese form with smaller leaflets on bristly petioles and with glandular-hispid branchlets and pedicels."

54170. ROSA ALBA L.

For previous introduction, see S. P. I. No. 54107.

54171. ROSA ALBERTI Regel.

Chenault No. 5630.

For previous introduction, see S. P. I. No. 54108.

54172. ROSA AMBLYOTIS Meyer.

For previous introduction, see S. P. I. No. 54109.

54173. ROSA ARVENSIS Huds.

For previous introduction, see S. P. I. No. 54110.

54164 to 54265—Continued.

54174. ROSA BALTICA Roth.

Chenault No. 3492.

A European shrub closely related to *R. canina* from which it differs in having purple stems with straight prickles and oblong-ovate, simply serrate leaflets. (Adapted from *Roth, Novae Species Plantarum, p. 234.*)

54175. ROSA BELGRADENSIS Pancic.

Chenault No. 5862. "This southern European rose, closely related to *R. rubiginosa*, is a medium-sized shrub with glandular-pubescent leaflets and clusters of pink flowers nearly 2 inches across."

For previous introduction, see S. P. I. No. 49105.

54176. ROSA BELLA Rehd. and Wils.

"A Chinese shrub often 8 feet in height, with seven to nine leaflets, solitary pink flowers 2 inches across, and ovoid scarlet fruits."

For previous introduction, see S. P. I. No. 43881.

54177. ROSA BLANDA Ait.

For previous introduction, see S. P. I. No. 54112.

54178. ROSA BLANDA Ait.

"Var. *alba*. A white-flowered form, of nursery origin."

54179. ROSA BORBONICA Morren. **Bourbon rose.**

Var. *Mme. Ernest Calvert.*

54180. ROSA CALIFORNICA Cham. and Schlecht.

For previous introduction, see S. P. I. No. 54113.

54181 to 54183. ROSA CANINA L. **Dog-rose.**

54181. Var. *subinermis.*

For previous introduction, see S. P. I. No. 54115.

54182. Received as *Rosa montivaga*, which is now referred to the dog-rose (*R. canina*).

54183. Received as *Rosa scabrata*, which is also now referred to *R. canina.*

54184 and 54185. ROSA CAROLINA L.

54184. A form of the Carolina rose from Campbell Mountain, Essex County, N. Y.

54185. Var. *Jack Siskow.*

For previous introduction, see S. P. I. No. 49109.

54186. ROSA CAUDATA Baker.

For previous introduction, see S. P. I. No. 54118.

54187. × ROSA CHABERTI Desportes.

"One of the many hybrids between *R. gallica* and *R. canina.*"

54188. ROSA CHINENSIS × NOISETTIANA.

Var. *Hebe's lip.*

54189. ROSA CINNAMOMEA L.
(*R. pendulina* L.)

For previous introduction, see S. P. I. No. 54120.

54190. ROSA CINNAMOMEA MALYI (Kerner) Skeels.
(*R. malyi* Kerner.)

"This Dalmatian rose, with bright-red flowers and leaflets similar to those of the Scotch rose, is possibly a hybrid between *Rosa cinnamomea* and *R. spinosissima.*"

For previous introduction, see S. P. I. No. 33199.

54164 to 54265—Continued.

54191. ROSA CUSPIDATA Bieb.

For previous introduction, see S. P. I. No. 54122.

54192. ROSA DAMASCENA Mill. **Damask rose.**

For previous introduction, see S. P. I. No. 54123.

54193. ROSA DAVURICA Pall.

For previous introduction, see S. P. I. No. 54124.

54194. ROSA DESEGLISEI Boreau.

For previous introduction, see S. P. I. No. 54125.

54195. ROSA FEDTSCHENKOANA Regel.

"A shrub native to Turkestan, with seven to nine oblong leaflets, clusters of one to four white flowers 2 inches across, and pear-shaped red fruits."

For previous introduction, see S. P. I. No. 43890.

54196. ROSA FENDLERI Crep.

For previous introduction, see S. P. I. No. 54127.

54197. ROSA FEROX Bieb.

For previous introduction, see S. P. I. No. 54128.

54198. ROSA FERRUGINEA Vill.

"An erect shrub native to the Alps and Pyrenees, with stems 5 to 7 feet high and covered with a purple bloom. The five to seven purplish leaflets and the clusters of deep-red flowers, followed by the red fruits, make this a decidedly ornamental species."

Received as *Rosa rubrifolia ferruginea*, but *R. ferruginea* is now generally given specific rank.

For previous introduction, see S. P. I. No. 43587.

54199. ROSA GALLICA L.

For previous introduction, see S. P. I. No. 54130.

54200. ROSA GALLICA L.

Var. *macrantha.*

54201. ROSA GALLICA × CANINA.

"One of the hybrids between *Rosa gallica* and the dog-rose (*R. canina*). A strong-growing, freely fruiting shrub, valuable as a stock."

54202 to 54204. ROSA GALLICA × (?).

"Compact shrubs well loaded with large fruits and seemingly suited for stock purposes."

54202. *Apothecary's* rose. **54204.** Var. *Crested Province.*

54203. Var. *Beranger.*

54205 to 54207. ROSA GLAUCA Vill.

54205. "(Chenault No. 5348.) A European shrub closely related to *Rosa canina* but having broadly ovate, bluish green leaflets and purplish flowers."

54206. Received as *Rosa complicata*, which is now referred to *R. glauca.*

54207. Received as *Rosa gallica reuteri*, but *R. reuteri* is now considered to be a form of *R. glauca.*

54208. ROSA GLUTINOSA Sibth. and Smith.

"A dwarf compact bush native to southeastern Europe, with five to seven orbicular leaflets, small pinkish white, solitary flowers, and globose bright-red fruits."

For previous introduction, see S. P. I. No. 49951.

54164 to 54265—Continued.

54209. ROSA HELIOPHILA Greene.

"A shrub 2 feet high, native to the prairies west of the Missouri River. The green stems are prickly, the 7 to 11 simply serrate leaflets are obovate and pubescent beneath, the small pink flowers are borne in clusters and are followed by red globose fruits."

54210. × ROSA HIBERNICA J. E. Smith.

"A hybrid between *R. canina* and *R. spinosissima*, with glaucous green foliage and small pink flowers."

For previous introduction, see S. P. I. No. 43716.

54211. × ROSA INVOLUTA J. E. Smith.
(*R. sabini* Woods.)

This Irish hybrid between *R. spinosissima* and *R. tomentosa* has five to seven oval leaflets densely pubescent beneath, usually solitary small pink flowers, and bright-red globose fruits. (Adapted from *Willmott, The Genus Rosa, p. 281.*)

54212. ROSA JACKII Rehder.

For previous introduction, see S. P. I. No. 54135.

54213. ROSA JUNDZILLI Besser.

For previous introduction, see S. P. I. No. 54136.

54214. × ROSA MACRANTHA Desportes.

Var. *superius.*

A hybrid between *R. canina* and *R. gallica*, this rose from southern France has arching green stems, five to seven subcoriaceous oblong leaflets, small clusters of large pink flowers, and red globose fruits. (Adapted from *Willmott, The Genus Rosa, p. 403.*)

54215. ROSA MAJALIS Herrmann. Cinnamon rose.
(*R. cinnamomea* L. 1759, not 1753.)

For previous introduction, see S. P. I. No. 54137.

54216. ROSA MANCA Greene.

A dwarf shrub seldom over one foot high, native to the mountains of Colorado, with usually seven obovate thin leaflets less than an inch in length, small solitary pink flowers, and globose fruits. (Adapted from *Greene, Pittonia, vol. 4, p. 11.*)

54217. ROSA MICRANTHA J. E. Smith.

For previous introduction, see S. P. I. No. 54138.

54218. ROSA MONTANA Chaix.

For previous introduction, see S. P. I. No. 54139.

54219. ROSA MOSCHATA NASTARANA Christ.
(*R. pissarti* Carr.)

A Persian form of the musk rose with five to seven smaller ovate leaflets, small clusters of large pure-white flowers and smooth globose red fruits. (Adapted from *Willmott, The Genus Rosa, p. 39.*)

54220. ROSA MULTIBRACTEATA Hemsl. and Wils.

"A western Chinese shrub 6 feet high with pairs of straight prickles, seven to nine broadly ovate leaflets, small clusters of pink flowers, and ovoid orange-red fruits."

For previous introduction, see S. P. I. No. 43902.

54221. ROSA MULTIFLORA Thunb.

(Chenault No. 5540.) "This well-known Japanese rose is a strong climbing shrub with nine obovate leaflets and large clusters of small white flowers."

For previous introduction, see S. P. I. No. 40626.

54164 to 54265—Continued.

54222. ROSA MULTIFLORA × CHINENSIS.
(*R. polyantha* Hort.)

"Received as *Rosa polyantha*, which is a trade name for many varieties originating as hybrids between the China rose and *R. multiflora*."

54223. ROSA OMISSA Desegl.

A shrub 3 to 5 feet high, native to Europe, with five to seven ovate-elliptical leaflets, pink flowers, and large smooth obovoid red fruits. (Adapted from *Billotia, vol. 1, p. 47.*)

54224 and 54225. ROSA OXYODON Boiss.

54224. For previous introduction, see S. P. I. No. 54142.

54225. (Chenault No. 5880.) Var. *caucasica.*

54226. ROSA PALUSTRIS Marsh.

Var. *nuttalliana.* "A horticultural form with flowers larger than in the type and appearing later in the season."

For previous introduction, see S. P. I. No. 49044.

54227. ROSA PISOCARPA A. Gray.

For previous introduction, see S. P. I. No. 54145.

54228. ROSA RUBRIFOLIA Vill.

A southern European shrub 6 feet high, with the whole plant glaucous and tinged with red. The five to seven oblong leaflets are simply toothed, the bright-red flowers are in small clusters, and the small globose fruits are red and pulpy. (Adapted from *Willmott, The Genus Rosa, p. 399.*)

54229. ROSA RUGOSA KAMCHATICA (Vent.) Regel.

For previous introduction, see S. P. I. No. 54149.

54230. ROSA RUGOSA × FERRUGINEA.

(Chenault No. 5383.) "A hybrid between the Japanese rose and *Rosa ferruginea* of Central Europe."

54231. ROSA SATURATA Baker.

(Arnold Arboretum No. 7169; Wilson No. 316.) "A central Chinese shrub often 8 feet high, nearly free from prickles, with seven ovate-lanceolate pale leaflets 2 to 3 inches long. The solitary dark-red flowers with purple stamens are followed by ovoid coral-red fruits nearly an inch long."

For previous introduction, see S. P. I. No. 49120.

54232. ROSA SETIPODA Hemsl. and Wils.

"This tall shrub often 10 feet high, native to central China, has pairs of wide-based straight prickles, seven to nine elliptical leaflets, loose corymbs of pale-pink flowers 2 inches across, and oblong-ovoid deep-red fruits an inch long."

For previous introduction, see S. P. I. No. 37978.

54233 to 54235. ROSA SPINOSISSIMA L. **Scotch rose**

54233. For previous introduction, see S. P. I. No. 54151.

54234. Var. *Jupiter*, a horticultural variety.

54235. Var. *penicillata.*

54236. ROSA SPINOSISSIMA ALTAICA (Willd.) Rehder.

Var. *maxima.*

For previous introduction, see S. P. I. No. 54152.

54164 to 54265—Continued.

54237. ROSA SPINOSISSIMA HISPIDA (Sims) Koehne.

For previous introduction, see S. P. I. No. 54153.

54238. ROSA SPINOSISSIMA LUTEOLA Andrews.
(*R. ochroleuca* Swartz.)

(Chenault No. 5760.) "A Scotch form differing from the type in having usually seven leaflets and pale-yellow flowers 2 inches across."

54239. ROSA SPINOSISSIMA × (?).

Var. *Lady Bailey.*

54240. ROSA SWEGINZOWII Koehne.

(Purdom No. 802.) "A western Chinese climber often 16 feet high, with usually nine ovate-oblong leaflets, small clusters of pink flowers, and oblong fruits an inch long."

For previous introduction, see S. P. I. No. 43915.

54241. ROSA TURKESTANICA Regel.

"A tall shrub native to Turkestan, with few prickles and bearing bright-red ovoid fruits an inch long."

For previous introduction, see S. P. I. No. 49122.

54242. ROSA VENOSA Swartz.

A Swedish shrub closely related to *Rosa canina*, from which it differs in the strongly veined, doubly serrate leaflets which are glabrous and glaucous beneath. (Adapted from *Sprengel, Systema Vegetabilium, vol. 2, p. 554.*)

54243 and 54244. ROSA VILLOSA L.

54243. Var. *arduenae.*

54244. Received as *Rosa pomifera*, which is now referred to *R. villosa.*

For previous introduction, see S. P. I. No. 54156.

54245. ROSA WEBBIANA Wall.

"An erect shrub native to the Himalayas of Turkestan, with five to nine very small orbicular glabrous leaflets, large solitary pink flowers, and ovoid bright-red fruits."

For previous introduction, see S. P. I. No. 49954.

54246. ROSA WICHURAIANA × (?).

Var. *Goldfinch.*

54247. ROSA WILLMOTTIAE Hemsl.

"A western Chinese rose forming a densely branched shrub often 10 feet high, with seven obovate leaflets, solitary rose-purple flowers, and bright orange-red globose fruits."

For previous introduction, see S. P. I. No. 32697.

54248. ROSA WOODSII Lindl.

For previous introduction, see S. P. I. No. 54158.

54249. ROSA XANTHINA Lindl.

Forma *normalis* Rehd. and Wils. "The single-flowered form of the Chinese yellow rose which had been described by Lindley in 1830 from a Chinese drawing and was not otherwise known until its discovery by Frank N. Meyer in 1907. The shrub is upright, often 10 feet high, with 7 to 11 elliptical, dentate leaflets, and solitary short-stalked yellow flowers about 2 inches across."

For previous introduction, see S. P. I. No. 21620.

54164 to 54265—Continued.

54250 to 54265. ROSA spp.

"Several roses received under names for which places of publication have not yet been found."

54250. "(Chenault No. 5351); labeled *R. chyraica*."

54251. "(Chenault No. 5866); labeled *R. kurdistena*."

54252. "Labeled *R. nivea villosa*."

54253. "(Chenault No. 5357); labeled *R. praecox*."

54254. "(Chenault No. 5353); labeled *R. urens*."

54255. "(Chenault No. 5524); labeled *R. cinnamonica*, but the seeds do not agree with seeds of either *R. cinnamomea* L. 1753 (*R. pendulina*) or with *R. majalis* Herrm. (*R. cinnamomea* L. 1759)."

54256. "(Chenault No. 5905); also labeled *R. cinnamonica*."

54257. "(Purdom No. 837.)"

54258. "(Purdom No. 841.)"

54259. "(Chenault No. 5372.)"

54260. "(Chenault No. 5905); small fruit."

54261. "Var. *Catherine Seyton*."

54262. "Var. *Shakespeare*."

54263. "The stock on which *R. turkestanica* had been grafted."

54264. "The stock on which *R. villosa* var. *arduenae* had been grafted."

54265. "An undetermined rose from Olney, Ill."

54266 and 54267. MALUS spp. Malaceæ. Crab apple.

From Geneva, N. Y. Seeds collected by H. C. Skeels, of the Office of Foreign Seed and Plant Introduction, for stock experiments by experts of the Department of Agriculture. Numbered September, 1921. Quoted notes by Mr. Skeels.

54266. MALUS BACCATA (L.) Moench.
(*Pyrus baccata* L.)

"Seeds of S. P. I. No. 24366 growing in the orchard at the Geneva experiment station. This number was sent originally from the Arnold Arboretum by Mr. Dawson, who recommended it as a good-keeping crab apple."

54267. MALUS sp.

"Seeds of S. P. I. No. 21065 growing in the Geneva experiment-station orchard. It was originally collected by Frank N. Meyer at Kirwin, Manchuria."

54268. MALUS CORONARIA (L.) Mill. Malaceæ. Crab apple.
(*Pyrus coronaria* L.)

From Takoma Park, Md. Seeds collected by H. C. Skeels, of the Office of Foreign Seed and Plant Introduction. Numbered September, 1921.

"Fruits collected under trees growing in my yard. These trees were grown by Dr. D. N. Shoemaker from seeds collected under wild trees near Arlington Experimental Farm, Va. The pink blossoms are to me the most beautiful and the most fragrant of our American flowers." (*Skeels.*)

54269 to 54281.

From Ecuador. Collected by Wilson Popenoe, Agricultural Explorer of the Department of Agriculture. Received July 21, 1921. Quoted notes by Mr. Popenoe.

54269 to 54281—Continued.

54269. BERBERIS QUINDUENSIS H. B. K. Berberidaceæ. **Barberry.**

"(No. 622. Hacienda La Esperanza, near El Angel, Province of Carchi. June 13, 1921.) *Espino.* Plants collected at an altitude of about 11,500 feet. This is one of the handsomest of the wild barberries which I have seen in Ecuador. It makes an arborescent shrub up to 10 or 12 feet high, and has large glossy, stiff dark-green leaves. The orange-yellow flowers, which are produced in racemes about 3 inches long, are half an inch broad. They are followed by small clusters of oval blue-black fruits. The species is worthy of a trial as an ornamental."

54270 to 54278. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

54270. "(Nos. 612 and 626. Hacienda San Vicente, Ibarra, Ecuador. May 28 and June 15, 1921.) Budwood of avocado No. 47, *Tamayo.*"

For previous introduction and description, see S. P. I. No. 53182.

54271. "(Nos. 614 and 628. Ibarra, Ecuador. May 27 and June 15, 1921.) Budwood of avocado No. 49, *Egas.*"

For previous introduction and description, see S. P. I. No. 53183.

54272. "(Nos. 615 and 629. Ibarra, Ecuador. May 28 and June 15, 1921.) Budwood of avocado No. 50, *Chota.*"

For previous introduction and description, see S. P. I. No. 53184.

54273. "(Nos. 616 and 630. Ibarra, Ecuador. May 27 and June 17, 1921.) Budwood of avocado No. 51, *Carchi.*"

For previous introduction and description, see S. P. I. No. 53185.

54274. "(No. 631. Ibarra, Ecuador. June 16, 1921.) Cuttings of avocado No. 52, *Irumina.* The parent tree stands in a huerta at the Hacienda Irumina, only a few hundred feet from the house, at an altitude of 6,200 feet. This variety, which appears to be of the Mexican type, though the fruit is rather thick skinned for one of that race, is notable for the excellent quality of its deep-yellow flesh. The fruit is long and slender, not of very convenient form; it weighs about 10 ounces and has a medium-sized seed. While it may not prove to be an avocado of great commercial value, it is certainly worthy of a trial in California and Florida.

"Formal description: The parent tree is about 50 feet high, erect in habit, with a spread of about 30 feet. It is probably 20 years old if not more. The trunk is 18 inches thick at the base, forked at 10 feet, and gives off lateral branches at 18 feet. It is said to bear good crops. The leaves when crushed are faintly anise scented.

"The fruit is pyriform to very slender pyriform, necked; weight about 10 ounces, length 5 to 6 inches, greatest breadth 2½ to 2¾ inches; base tapering, often curved to one side; stem inserted centrally, apex rounded to broadly pointed; surface light green, with numerous greenish yellow dots; skin scarcely 0.5 millimeters thick, rather firm and tough; flesh cream-yellow, pale green close to the skin, with very few fiber markings, the flavor very rich, nutty, and pleasant; quality excellent; seed conical, rather slender, medium sized, loose or tight in the cavity. Main ripening season at Irumina probably from December to March.

"The season at which it will ripen in the United States can not be ascertained without a trial in California and Florida."

54275. "(No. 632. Ibarra, Ecuador. June 16, 1921.) Cuttings of avocado No. 53, *Imbabura.* The parent tree stands in the huerta at the Hacienda Irumina, only a few hundred feet from the house and about 50 feet from tree No. 52, at an altitude of 6,200 feet. This is a Mexican avocado of medium size (for that race), of good quality, and in every way a desirable fruit, so far as can be ascertained by a brief study of the variety. It will require a test

54269 to 54281—Continued.

in the United States, however, to determine whether or not it has characteristics which make it of commercial value.

"Formal description: The parent tree is about 45 feet high, with a spread of 60 feet, and is at least 50 years old. The trunk is 3 feet thick at the base, forked at 10 feet above the ground. The crown is rather open, and some of the main limbs extend almost horizontally. The foliage when crushed is distinctly anise scented.

"The fruit is oblong-obovoid; weight 6 to 7 ounces, length about 4 inches, greatest breadth about 2½ inches; base bluntly pointed, with the stem inserted to one side; apex rounded to broadly pointed; surface pale olive-green, blushed with maroon-purple, and with very numerous large whitish green dots; skin not quite 0.5 millimeter thick, firm and leathery in texture; flesh rich cream-yellow, greenish close to the skin, with few fiber markings, the flavor very rich, nutty, and pleasant; quality excellent; seed oblong-conic, tight to slightly loose in the cavity. Ripening season at Irumina mainly from December to March.

"This fruit when grown under good cultivation in the United States will probably weigh from 8 to 10 ounces. The season at which it will ripen in that country can be ascertained only by a trial."

54276. "(No. 633. Ibarra, Ecuador. June 16, 1921.) Cuttings of avocado No. 54, *Capac*. The parent tree is growing in the huerta rented by Rosa Gonzales, at the Hacienda Carpuela, at an altitude of 5,300 feet. The fruit is a good-sized Mexican avocado about 9 ounces in weight, obovoid in form, purple, and of excellent quality. The seed is relatively small, and the tree is said to be very productive. The variety is worthy of a trial in California and in the cooler avocado-growing regions of Florida.

"Formal description: The parent tree is about 45 feet high, slender and erect in habit, with a trunk 18 inches thick at the base, forked 2 feet above the ground. The oval crown is moderately dense, and the foliage rich green in color and healthy in appearance.

"The fruit is oblong-pyriform to oval-obovoid in form; weight about 9 ounces, length 4 to 4½ inches, greatest breadth about 2¾ inches; base broadly pointed, the stem inserted slightly to one side; apex rounded to slightly and obliquely flattened; surface of ripe fruit glossy purple-black, with very few dots visible; skin less than 0.5 millimeter thick, relatively tough; flesh yellowish cream color, tinged green near the skin, with numerous fiber markings; flavor nutty, rich, and pleasant; quality good; seed rather small, ovate to oval, tight in the cavity with both seed coats adhering closely to the cotyledons. Ripening season mainly from November to March, but a few fruits ripen at other seasons of the year.

"Some specimens do not show any fiber discoloration in the flesh; this is perhaps a question that depends, to a certain extent, upon the degree of maturity which the fruit has reached at the time it is picked."

54277. "(No. 634. Ibarra, Ecuador. June 16, 1921.) Cuttings of avocado No. 55, *Inca*. The parent tree is growing in one of the huertas at the Hacienda San Vicente, a few hundred yards north of the house, at an altitude of 6,100 feet. This is one of the most promising avocados obtained in the Chota Valley, if not the most promising of all. It is an unusually large fruit for one of the Mexican race, and at the same time has a very small seed, and flesh of excellent quality. It is worthy of a careful trial in the avocado-growing regions of the United States.

"Formal description: The parent tree is about 50 feet high and of erect round-topped form, with an open well-branched crown. The trunk is about 2 feet thick at the base and gives off several large limbs about 10 feet above the ground. There is a faint aniselike odor to the crushed leaves. So far as can be

54269 to 54281—Continued.

ascertained by an examination of the tree it is of the Mexican race; there is a possibility, however, that it may be a hybrid between this race and the West Indian.

"The fruit is pyriform-obovoid to oblong-obovoid; weight 10 to 15 ounces; length 4¼ to 5 inches; greatest breadth 3 to 3½ inches; base broadly pointed, the stem inserted obliquely; apex slightly and obliquely flattened; surface smooth, pale yellow-green, with numerous large cream-colored dots; skin thin, less than 0.5 millimeter; flesh yellowish cream color, pale green very close to the skin, with very few and inconspicuous fiber markings, and of smooth oily texture, the flavor rich, not watery, very agreeable, with pronounced nutty character; quality excellent; seed round-conic, relatively small, tight in the cavity or nearly so, the seed coats sometimes separating over a portion of the seed, cotyledons slightly rough.

"The season of this variety, as of others in the Chota Valley, is difficult to determine accurately. The main crop probably ripens from September to December, but there are a few fruits available at nearly all times of the year."

54278. "(No. 635. Ibarra, Ecuador. June 16, 1921.) Cuttings of avocado No. 56, *Huira*. The parent tree is growing in one of the huertas at the Hacienda Carpuela, at an altitude of 5,300 feet. This is a Mexican variety of good size and quality. While not as promising as some of the other varieties in the Chota collection, it is well worthy of a trial in California and in the cooler portions of the avocado-growing region of Florida. It should prove to be fairly hardy.

"Formal description: The parent tree is about 40 feet high, erect and shapely in form, and apparently a vigorous grower. The foliage when crushed is distinctly anise scented. The trunk is about 15 inches thick at the base and branches at 8 feet above the ground.

"The fruit is obovate in form; weight about 8 ounces, length nearly 3 inches; base pointed, with the stem inserted obliquely; apex thin, as is characteristic of the Mexican race; flesh cream-yellow, tinged green near the skin, with a few fiber markings; flavor unusually rich and nutty; quality excellent; seed broadly obovoid-conic, rather large, tight in the cavity, with both seed coats closely surrounding the nearly smooth cotyledons. Season at Carpuela not definitely known; the main crop probably matures between October and January, but there are a few ripe fruits available at other times of the year. It is impossible to predict with accuracy the season at which this, as well as the other varieties from the Chota Valley, will ripen their fruits in the United States; the matter can be determined only by trial."

54279 and 54280. RUBUS ADENOTRICHOS Schlecht. Rosaceæ.

Blackberry.

54279. "(No. 623. Ibarra, Ecuador. June 13, 1921.) Plants of *Mora común*. From the Hacienda La Rinconada, in the Province of Carchi, at an altitude of about 11,000 feet. This is a very vigorous Rubus, forming large clumps up to 15 or 18 feet high. Its stout canes are thickly clothed with short, stiff, bright maroon-colored hairs, while its leaves are formed of five ovate-acuminate to oblong-acuminate, finely serrate leaflets 3 to 4 inches long. The white flowers are produced in large loose panicles sometimes more than a foot in length and are followed by an abundance of oval deep-purple fruits about three-quarters of an inch long. The drupelets are numerous and crowded closely together; the seeds are moderately large, but not very troublesome in the mouth. The flavor is practically the same as that of the cultivated blackberry of the North, and the quality is good. Because of its productiveness as well as this latter feature, the species is worthy of a trial in the southern and western United States."

54269 to 54281—Continued.

54280. "(No. 624. Ibarra, Ecuador. June 13, 1921.) A slightly different variety."

For previous introduction, see S. P. I. No. 53995.

54281. VACCINIUM FLORIBUNDUM H. B. K. Vacciniaceæ. **Mortiño.**

"(No. 621. Ibarra, Ecuador. June 13, 1921.) Plants of *mortiño* from Hacienda La Rinconada, Province of Carchi, Ecuador, at an altitude of about 11,500 feet. A very abundant indigenous plant throughout the Ecuadorian highlands at altitudes between 10,000 and 12,000 feet. It is not cultivated. The fruit is sometimes brought into the markets of Andean villages. In some parts of the country its ripening season, March to August, is the occasion for picnics in the campo, the inhabitants of the towns and villages betaking themselves to the páramos, where this plant grows abundantly, to gather and eat the fruit.

"The *mortiño* is a slender, handsome shrub about 6 feet high (often lower than this), with very small elliptic to ovate-acute, finely serrate leaves crowded on the stems, and small bell-shaped deep-pink flowers produced in great abundance. The fruit is roundish, up to about one-third of an inch in diameter, deep glaucous blue, juicy, subacid and pleasant to the taste, and containing several very small seeds. It greatly resembles some of the blueberries of the United States and could probably be developed by cultivation into a much more valuable fruit than it is to-day."

54282 to 54296. ORYZA SATIVA L. Poaceæ. **Rice.**

From Saigon, Cochin China, French Indo China. Seeds presented by M. E. Carle, director, Laboratoire de Genetique, Institut Scientifique de l'Indochine. Received September 13, 1921. Notes adapted from Bulletin Agricole, de l'Institut Scientifique de Saigon, vol. 2.

54282. *Bóng-chanh.* An excellent variety of the Gocong type with a growing period of 202 to 234 days, and a yield (February 17 to 25) of 1,726 to 2,667 kilograms per hectare (1,539 to 2,375 pounds per acre). Originated at Dinhthoi (Cantho). (*P. 42.*)

54283. *Bóng-dua.* A good variety of the Gocong type, yielding in 183 to 235 days (February 17 to 25) 1,664 to 3,600 kilograms per hectare (1,484 to 3,211 pounds per acre). From Saigon. (*P. 42.*)

54284. *Bóng-sen.* A fine variety of the Gocong type originated in the neighborhood of Cantho with a growing period of 162 to 215 days, and a yield of 2,360 to 3,850 kilograms per hectare (2,105 to 3,434 pounds per acre). (*P. 42.*)

54285. *Cadung Baria.*

54286. *Cadung Gocong.* A fine grain of the Gocong type from the Seed Selection Laboratory, with a growing period of 152 days, maturity January 30, and a yield of 1,652 kilograms per hectare (1,470 pounds per acre). (*P. 43.*)

54287. *Huéky.* A variety of American production, with a round dense grain of the Gocong type, maturing in 166 to 230 days from date of sowing. The yield varies from 1,200 to 3,851 kilograms per hectare (1,070 to 3,040 pounds per acre).

The plant grows vigorously to a height of 1.4 to 1.6 meters (5 feet) and fruits abundantly. This nonshattering variety has proved resistant to disease and drought which greatly reduced the yield of other varieties. The head is 23 to 25 centimeters (9 to 10 inches) long, and the shelled grains are large, regular, and white. It has been given superior ranking over Spanish rice. (*Pp. 43 and 75.*)

54288. *Lu-phung-tien.* A variety of the Gocong type sent out from Saigon, with a growing period of 180 to 208 days, maturity January 18 to February 15, and yields of 2,321 to 2,967 kilograms per hectare (2,070 to 2,646 pounds per acre). (*P. 42.*)

54282 to 54296—Continued.

54289 to 54292. These four numbers represent a series of forms of so-called floating rices, rice with a different flavor from that of ordinary rice. For the first two months floating rice grows like ordinary rice, but later floods of the Mekong River, which start in July, gradually submerge all of the plant except the leaf tips. The water recedes after November, the stalks bend down, and when the lower part touches the ground the nodes take root.

The stalk of floating rice is thicker than that of ordinary rice and is from 2.5 to 5 meters (8 to 16 feet) long. Only the tips of the stalks are leafy. The growing period is 8 to 9 months, from April or May to December or January. No care is given the crop after the sowing. (*P. 46.*)

54289. *Nam-rian*, or *ba sao*. A recent introduction from Cambodia, with stalks 12 feet long and thick heads, up to a foot long. (*P. 49.*)

54290. *Nàng-dùm*. A recent introduction from Cambodia. Of the floating rice group, this is the only variety which yields white fine rice; it requires only a medium supply of water. The grain falls easily from the short head. (*P. 48.*)

54291. *Nàng-gông-trang*. A variety of the Gocong type, sent out from Saigon, with medium-sized grain yielding (1917, December 11, to 1918, February 26) 2,337 to 2,967 kilograms per hectare (2,080 to 2,747 pounds per acre). (*P. 42.*)

54292. *Nàng-rùm*. A variety from Saigon with a normal growing period of 120 days, maturity from December 20 to January 5 and a normal yield of 1,500 to 2,167 kilograms per hectare (1,338 to 1,932 pounds per acre). (*P. 41.*)

54293. *Ramay*. A large round grain of the type Gocong, which much resembles *Huêky*. Maturity requires 166 to 228 days; the yield is from 1,083 to 3,677 kilograms per hectare (966 to 3,281 pounds per acre). Cultivated at Cantho, Saigon. (*P. 43.*)

54294. *Rá-muoi*. A fine variety with a large round seed, of the Gocong type, with a growing period of 195 to 220 days and a yield (February 20, 21) of 1,684 to 3,722 kilograms per hectare (1,502 to 3,321 pounds per acre). Originated at Dinhthoi (Cantho). (*P. 42.*)

54295. *Sào-ong*. This fine variety of the Gocong type originated in the neighborhood of the station of Cantho, has a growing period of 188 to 199 days, ripens January 25, and yields 2,474 to 3,466 kilograms per hectare (2,207 to 3,092 pounds per acre). (*P. 42.*)

54296. *Song-lon*. The oldest known variety, extensively distributed from Cambodia. The large thick grains are in heads 7 to 9 inches long. (*P. 48.*)

54297. Warszewiczia coccinea (Vahl) Klotzsch. Rubiaceæ.

From Panama. Cuttings collected by Dr. David Fairchild, Agricultural Explorer in Charge of the Office of Foreign Seed and Plant Introduction. Received September 16, 1921.

"This is a remarkable ornamental tree. Mr. Dorsett and I first saw it on the banks of Gatun Lake at Rio Sucio. At a distance its racemes, over 2 feet long, with their brilliant scarlet enlarged sepals produced a startling splash of color against the dark-green foliage. The color is as vividly scarlet as the autumn colors of the sour gum, the sorrel tree, or some species of Japanese maple. The colored 'leaves' are in reality enlarged sepals. Only one flower in each cluster of flowers on the raceme has an enlarged sepal. Though the flowers themselves are not over a quarter of an inch in diameter, the enlarged sepals are often 2½ inches long. The fact that this tree blooms in summer, the wet season, whereas most of the showy flowering trees of the Tropics bloom in the dry season, would seem to make this an unusually valuable ornamental tree for tropical regions. It is certainly worthy of a place in every collection of tropical trees." (*Fairchild.*)

54298. RHOPALOSTYLIS SAPIDA (Soland.) Wendl. and Drude. Phœnicaceæ. **Nikau palm.**

From Birkenhead, Auckland, New Zealand. Seeds presented by C. L. Wragge. Received September 28, 1921.

An extremely elegant palm native to New Zealand, where the young inflorescence is eaten. The palm is of peculiar interest as being one of the most southern, occurring as far as latitude 38° 22′ S., whereas 38° S. is the limit of palms in Australia and South America, and 30° S. in Africa. The trunk 6 to 12 feet high bears pinnate leaves 4 to 6 feet long and a much-branched densely flowered spadix 18 to 24 inches long. The pale pinkish flowers are very numerous. (Adapted from *Curtis's Botanical Magazine, pl. 5139.*)

For previous introduction, see S. P. I. No. 47878.

54299 to 54302. MALUS SYLVESTRIS Mill. Malaceæ. **Apple.**

From Santiago, Chile. Scions presented by Sr. Salvador Izquierdo. Received September 30, 1921. Quoted notes by Wilson Popenoe, except as otherwise stated.

"Four varieties of apples which I have selected during recent years, and which I consider very interesting. They are entirely resistant to the attacks of the woolly aphis (Schizoneura)." (*Izquierdo.*)

"Chilean apples are probably inferior to our own, in so far as dessert quality is concerned. Most of them are small fruits, with rather mealy flesh of sweet and not very sprightly flavor. They are interesting to us because of their resistance to the woolly aphis, the worst pest of Chilean orchards. The main purpose in introducing them is for trial as aphis-resistant stock plants on which to graft our best commercial sorts."

54299. "*Admirable de Otoño* (*Autumn Beauty*). Described by Sr. Izquierdo as a large excellent autumn fruit. The tree is very productive."

54300. "*Huidobro.* Also known as *Araucana* and *Araucana Huidobro.* This is said to have originated from an Italian seed. The tree is described as very vigorous and productive; the fruit is medium to large, yellow, of firm texture, sweet, aromatic, and juicy. Its ripening season is late autumn (April to May in Chile), and the fruits can be kept in good condition without cold storage until the following October or sometimes November. Its shipping qualities are excellent.

"This variety can not be strongly recommended as a dessert apple and is not introduced as such; immunity from the attacks of the woolly aphis is the quality which gives it interest and makes it valuable in Chile and perhaps elsewhere. Sr. Izquierdo has found that plants of this variety grafted on seedling apple roots will be attacked by the aphis only from the roots upward to the union of stock and scion, not a single insect ever passing on to the scion to carry on his nefarious activities.

"Because of this characteristic, it is possible that *Huidobro* may have value in the United States as a stock plant on which to graft other and better varieties of the apple."

54301. "*Productiva* (productive). A large fruit striped with red, ripening in April and May in central Chile."

54302. "*Citronelle.* A small sweet yellow apple, said to be an excellent keeper."

54303. CRINODENDRON PATAGUA Molina. Elæocarpaceæ. **Patagua.** (*Tricuspidaria dependens* Ruiz and Pav.)

From Kew, England. Cuttings presented by Sir David Prain, director, Royal Botanic Garden. Received September 30, 1921.

A small, compact, rather spreading evergreen tree, 20 to 30 feet high, with elliptic leaves up to 2½ inches long and white axillary flowers nearly an inch long, borne on long curved stalks. The wood is very white and is much used

for carpentry and even for cabinetmaking; the bark is employed in tanning; and silkworms relish the leaves. Native to moist situations in central Chile, where it ascends to nearly 4,000 feet. (Adapted from *Kew Bulletin of Miscellaneous Information, 1907, p. 13,* and *Curtis's Botanical Magazine, pl. 8115.*)

54304. Gladiolus alatus L. Iridaceæ.

From Pretoria, Transvaal, South Africa. Seeds presented by I. B. Pole Evans, chief, Division of Botany. Received September 26, 1921.

A very interesting little South African plant with flowers of a delightful fragrance not unlike that of the sweetbrier; the three upper petals are bright orange-scarlet, the three lower ones are yellowish tipped with orange-scarlet. The bulbs are not larger than ordinary peas and can not remain long out of ground. (Adapted from *Allen, Bulbs and Tuberous-Rooted Plants, p. 105.*)

For previous introduction, see S. P. I. No. 44722.

54305. Paullinia cupana Kunth. Sapindaceæ.

From Para Valley, Para, Brazil. Seeds presented by A. Law Vege, through J. A. McCutchin, Federal Horticultural Board. Received September 16, 1921.

"The seed requires three months to germinate and should be planted in clay soil mixed with sand, half and half. They are very delicate, being killed in two days when exposed to dryness. About 74 per cent of seeds, preserved in water for two weeks, germinated, although fermentation had set in. The plant is naturally a vine, though in commercial plantings in Brazil it is trained as a bush. It requires shade while young. The plant has the highest percentage of caffein of any plant known." (*Voge.*)

From this species is obtained guarana, which is used not only as a remedy for intestinal trouble but also as a very powerful stimulant that enables one to endure almost superhuman fatigue. Guarana is a black paste, extracted from the seeds of the grapelike fruits found growing along the upper Tapajoz, and in the valley of the Orinoco in Venezuela.

In November the fruits mature; the moist soft seeds are carefully removed and spread in the sun to dry. A few hours are sufficient to give them a flinty brittleness. The kernels are then reduced to powder; and, with the addition of a little water or by exposure to the damp air of the swamps, a thick paste is obtained, which is molded into cylinders about an inch in diameter and 6 inches long. The dry cylinder assumes an almost mineral hardness. This is the guarana of commerce. When powdered it ferments rapidly and its medicinal properties come into play.

The Indians also utilize the roots and leaves of the Paullinia for the making of inferior grades of guarana. Even the blossoms are burned and the ashes yield still another variety known as "guarana putira," or "guarana flor." The Indians and whites who use guarana file a small portion from the cylinder, dissolve it in water, and drink it. The whites generally add sugar to neutralize the bitter taste of caffein. The chief medicinal value of guarana is its salutary action on the intestinal secretions when taken in small and not too frequent doses. Repeated doses result in a general breakdown of the nervous system.

Analysis of 100 grams of guarana.

	Grams.
Caffein	5.388
Essential oil	2.950
Resin	7.800
Coloring matter	1.570
Saponin	.060
Guarana-tannic acid	5.902
Pyro-guarana acid	2.750
Starch	9.350
Glucose	.777
Pectic acid, malic acid, dextrin, etc	7.470
Vegetable fiber	49.125
Water	7.650

The young shoots are planted about 20 feet apart, and in the course of 10 years the plant occupies an area of from 10 to 15 square feet. The plants bear fruit in the third or fourth year and will yield from 6 to 8 pounds of seeds, about the size and color of a grain of corn, annually for 35 to 40 years. Plants raised from seed do not bear fruit until the fifth year and live but a few years. (Adapted from *Bulletin of the Pan American Union, vol. 51, p. 268.*)

54306. Clusia grandiflora Splitg. Clusiaceæ.

From Cambridge, England. Cuttings presented by F. G. Preston, superintendent, Botanic Garden. Received September 30, 1921.

A very beautiful plant up to 11 feet high with handsome large white rose-tinted flowers, each from 7 to 8 inches in diameter. The flowers are fleshy with a delicate white fringe around the center of a deep-yellow, discoid, gummy mass of staminodes. Three flowers are usually borne at the end of a shoot, the central one opening first and hiding the two side buds which open later. This native of Guiana has large handsome leathery leaves, up to 18 inches long and over 7 inches wide; they are borne in clusters towards the end of the twigs. The plant is not in any way susceptible to insect pests. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 67, p. 315.*)

54307 and 54308.

From Honolulu, Hawaii. Plants collected by J. F. Rock, Agricultural Explorer of the Department of Agriculture. Received August 26, 1921.

54307. Cola nitida (Vent.) Schott and Endl. Sterculiaceæ.
(*Sterculia nitida* Vent.)

A tree 20 to 30 feet high, native to Upper Guinea, Africa, closely related to the common cola nut, from which it differs in the broader, shorter stalked leaves, and flowers nearly double the size. These trees furnish the cola nuts so much esteemed by the natives for their bitter flavor, and which are said to enhance the taste of whatever is eaten with them. The numerous seeds are in leathery or woody pods. (Adapted from *Oliver, Flora of Tropical Africa, vol. 1, p. 221.*)

54308. Quercus javanica (Blume) Drake. Fagaceæ.
(*Castanopsis javanica* A. DC.)

A large evergreen tree with very leathery leaves which are shining above, more or less rufous pubescent beneath, and 3 to 10 inches long. The globose tomentose involucres, up to 2 inches in diameter with spines sometimes two-thirds of an inch long, inclose 1 to 4 nuts. Native to Lower Burma and the Malay Peninsula. (Adapted from *Hooker, Flora of British India, vol. 5, p. 620.*)

54309. Dioscorea esculenta (Lour.) Burkill. Dioscoreaceæ. Lesser yam.

From Suva, Fiji Islands. Tubers presented by C. H. Knowles, Director of Agriculture. Received September 17, 1921.

This small yam, the *kawai*, is certainly worth the attention of anyone who has facilities for cultivating a small area of food plants. Being indigenous to Fiji, the natives have long recognized its value as a food, and it is cultivated in most if not all of the Fiji Islands. It is cultivated in parts of India and Burma. In the latter it is said to be found wild.

The stem of this creeper is round and full of prickles. It is propagated by planting the small tubers or roots, which, like the old ones, are oblong, of a brownish color outside and a pure white within. When cooked, the skin falls off like the bark of a birch tree. The root is very farinaceous, and when well cooked looks like a fine mealy potato, although of superior whiteness. The taste recalls to mind that of the arracacha of South America. There is a slight degree of sweetness about it which is very agreeable to the palate.

The *kawai* can be grown in districts too wet for the finer varieties of the yam, and it is not attacked by the leaf fungus *Gloeosporium postis* which attacks yams, particularly the better varieties, and is very severe in wet years. Good land is necessary for a good crop, and it must be well drained.

No insect pests or fungous diseases were found to damage the plant during 1916 to 1919.

The *kawai* can be either boiled or roasted, and, as with the potato, it is best not to remove the skin before cooking. A thorough cleaning is the only preparation necessary. (Adapted from *Agricultural Circular, Fiji, vol. 1, p. 86.*)

54310. Coix lacryma-jobi ma-yuen (Rom.) Stapf. Poaceæ. **Ma-yuen.**

From Manila, Philippine Islands. Seeds presented by Sr. Adn. Hernandez, director, Bureau of Agriculture. Received September 23, 1921.

"A newly domesticated variety grown in Occidental Negros Province, Philippine Islands, where no disease is reported." (*Arsenio Goco, plant inspector.*)

"Our experiments have shown this to be a promising cereal for the Tropics." (*Hernandez.*)

For previous introduction, see S. P. I. No. 49798.

54311. Dendrocalamus longispathus Kurz. Poaceæ. **Bamboo.**

From Dehra Dun, United Provinces, India. Seeds presented by R. S. Hole, forest botanist. Received September 7, 1921.

A large handsome species with tufted glaucous-green culms up to 60 feet high, the upper branches bearing smooth lanceolate yellow-ribbed leaves the under surface of which is rough and glaucescent or sometimes almost white. The internodes are up to 2 feet long with walls 5 inches thick. The species comes nearest *Dendrocalamus hamiltonii* but is easily recognized by its long fragile papery culm sheaths densely hairy on the back, and by the large panicles of small flower heads and blunt spikelets. One of its local Burmese names is "wa-ya" (stinging bamboo), for the hairs on the sheath are especially irritating. Although native to eastern Bengal and Burma, chiefly along streams, it has been cultivated in Calcutta, Malabar, etc., but the culms are not very strong, and as a building material it is generally inferior to many other kinds. (Adapted from *Annals of the Royal Botanic Garden, Calcutta, vol. 7, p. 89.*)

54312 to 54318.

From Jujuy, Argentina. Collected by D. S. Bullock, agricultural trade adviser, Bureau of Markets and Crop Estimates, United States Department of Agriculture. Received September 24, 1921.

54312 to 54315. Solanum tuberosum L. Solanaceæ. **Potato.**

"Tubers bought at Market Place, Jujuy, Argentina, August 1, 1921." (*D. S. Bullock.*)

54312. No. 1. **54314.** No. 3.

54313. No. 2. **54315.** No. 4.

54316. Oxalis tuberosa Molina. Oxalidaceæ. **Oca.**

"Seeds of *papa oca* bought at Market Place, Jujuy, Argentina. Said to grow at an altitude of 9,000 feet." (*D. S. Bullock.*)

54317 and 54318. Zea mays L. Poaceæ. **Corn.**

Seeds introduced for experimental purposes.

54317. No. 1. **54318.** No. 2.

54319. Hydnocarpus wightiana Blume. Flacourtiaceæ.

From Sibpur, near Calcutta, India. Seeds presented by Lieut. Col. A. T. Gage, director, Royal Botanic Garden. Received September 30, 1921.

"A tree common on the western Peninsula from the Konkan along the coast ranges of India, 40 to 50 feet high, with smooth ovate to lanceolate leaves, and globose fruits the size of a small apple. The numerous yellowish seeds have oily albumen. (Adapted from *Cooke, Flora of Bombay, vol. 1, p. 57.*)

"At present the oil from the seeds is used in Calcutta (School of Tropical Medicine) in the treatment of leprosy." (*J. F. Rock.*)

For previous introduction, see S. P. I. No. 52859.

54320. Rubus sp. Rosaceæ.

From San Salvador, Salvador. Seeds collected by P. H. Dorsett, plant introducer, Department of Agriculture. Received September 30, 1921.

"Seeds secured in the market, San Salvador, September 6, 1921. Cylindric fruits 1½ inches long, 1 inch in diameter, deep maroon in color, with plenty of wine-red juice. Flavor acid but quite pleasant." (*Dorsett.*)

54321. Coleus rotundifolius (Poir.) Cheval. and Perr. Men- (*C. tuberosus* A. Rich.) [thaceæ.

From Mount Silinda, Southern Rhodesia. Tubers presented by W. L. Thompson. Received September 13, 1921.

"Tubers which serve as food for the natives of this district, and of which we often partake. The native name is *zwidata*. The tubers may be described as a substitute for Irish potatoes. We find that they are fine prepared in the same way as creamed potatoes. They are not very mealy but could scarcely be called watery. If they could be induced to grow to a larger size, with increase rather than decrease of other good qualities, I think they might be quite a useful plant. I think they are quite prolific yielders. They require quite a long season to mature, and I presume that, if these reach you in condition to grow, it would be necessary to start them in a greenhouse. The tubers send out sprouts much as do sweet potatoes." (*Thompson.*)

For previous introduction, see S. P. I. No. 51768.

54322 to 54325.

From Alipur, Bengal, India. Seeds presented by the Agricultural and Horticultural Society of India, through E. N. Reasoner, Oneco, Fla. Received September 28, 1921.

54322. Cassia alata L. Cæsalpiniaceæ.

A coarse erect branched shrub 5 to 10 feet high, with stout green branches and pinnate leaves up to 2 feet long. The yellow flowers, 1½ inches wide, are in racemes 4 to 20 inches long. The valves of the straight spreading pods have a papery wing running from end to end. The active principle of the seeds is chrysophanic acid. Every portion of the plant is used medicinally. The plant is native to tropical America but is now cultivated all over the Tropics. (Adapted from *Rock, Leguminous Plants of Hawaii, p. 83.*)

For previous introduction, see S. P. I. No. 49989.

54323. Dioclea lasiocarpa Mart. Fabaceæ.

A shrubby plant twining over tall trees, with sparsely pubescent trifoliolate leaves, the somewhat-pointed leaflets 2 to 5 inches long. The purple-violet flowers, with fringed keel and papery deciduous bractlets, are on peduncles 1 to 1½ feet long. Native to tropical American forests. (Adapted from *Martius, Flora Brasiliensis, vol. 15, pt. 1, p. 166.*)

54324. Ochna squarrosa L. Ochnaceæ.

A shrub or small tree with smooth shining leaves 2 to 5 inches long and fragrant yellow flowers an inch long, clustered on the old wood or on short leafless branchlets. The compound drupaceous fruits are black. Native to the East Indies and Burma. (Adapted from *Cooke, Flora of Bombay, vol. 1, p. 196.*)

54322 to 54325—Continued.

54325. PETREA VOLUBILIS L. Verbenaceæ.

"A woody climber of exquisite beauty when in full flower. The heliotrope violet-centered blossoms are borne in loose pendent sprays which hang gracefully from the slender arching branches. These, combined with the rigid green leaves, suggest almost an artificial blossom. Native to tropical South America and some of the West Indies." (*H. F. Macmillan.*)

54326. AVENA SATIVA L. Poaceæ. **Oats.**

From Edinburgh, Scotland. Seeds presented by George Sinclair, manager, Earl of Roseberry's Dalmeny farms. Received September 30, 1921.

"*Scotch Newmarket* oats which by breeding have been increased to a yield of 100 bushels per acre and a weight of 56 pounds per bushel." (*Lou D. Sweet, Denver, Colo.*)

54327 to 54329. NAGEIA spp. Taxaceæ. **Yellowwood.**
(*Podocarpus* spp.)

From Pretoria, Union of South Africa. Seeds presented by E. Percy Phillips, division of botany. Received September 29, 1921.

"I am sending seeds of species of South African yellowwoods which may interest you. As the genus is now under revision at Kew, the Herbarium numbers of the forestry department should be kept, as they will be quoted in the monograph when published." (*Phillips.*)

54327. NAGEIA sp.
Herbarium No. 3467.

54328. NAGEIA sp.
Herbarium No. 3466.

54329. NAGEIA sp.
Herbarium No. 3392.

54330. CARICA PAPAYA L. Papayaceæ. **Papaya.**

From Canal Zone. Seeds collected by Dr. David Fairchild, Agricultural Explorer in Charge of the Office of Foreign Seed and Plant Introduction. Received September 16, 1921.

"An oblong-fruited form of exquisite flavor. Grown in the plantations of the Government at Bracho Mindi and served in the hotels of the Panama Railway Co." (*Fairchild.*)

54331. CENTAUREA RAGUSINA L. Asteraceæ.

From Chemin des Grottes St. Helene, Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received September 26, 1921.

"A strikingly ornamental long-lived plant. I have two nearly 30 years old, growing on a perpendicular wall. Very few good seeds are produced and germination seems difficult; any stagnant moisture should be avoided. It is best to mix the seeds with soil, spread the mixture out in a fissure of a rock and keep slightly moist." (*Proschowsky.*)

For previous introduction, see S. P. I. No. 48027.

54332. OCHROMA LAGOPUS Swartz. Bombacaceæ. **Balsa.**

From Camaguey, Cuba. Seeds presented by Dr. R. L. Luaces, director, Granja Escuela. Received September 23, 1921.

"Seeds from this spring's crop. The seeds are very small and embedded in the lint, which is a silk cotton that does not absorb water, and for this reason it is used for life belts. The wood of the tree is stronger and much lighter than basswood and is being used in aeroplane construction. I believe it will grow well in southern Florida, around Brownsville, Tex., and in parts of California." (*Luaces.*)

For previous introduction, see S. P. I. No. 53490.

54333 to 54335. ANDROPOGON spp. Poaceæ. **Beard-grass.**

From Loanda, Angola, Africa. Seeds presented by J. Gossweiler, through H. A. Longworth, agricultural missionary, Angola Mission, Malanzhe, Angola. Received September 16, 1921.

"Grasses of Angola, which may be useful for forage." (*Longworth.*)

54333. ANDROPOGON FASTIGIATUS Swartz.

A slender erect smooth annual with flat narrow leaves. The freely branching culms bear broad racemes with conspicuous sterile spikelets and geniculate awns about 1½ inches long. Native to dry open ground from southern Mexico and the West Indies to Brazil. (Adapted from *Contributions from the National Herbarium, vol. 18, p. 279.*)

54334. ANDROPOGON GAYANUS Kunth.

A tall perennial with numerous flowering branches, rather stout racemes of reddish or brownish spikelets, and awns about an inch long bent in the middle. Native to Senegal. (Adapted from *Thiselton-Dyer, Flora of Tropical Africa, vol. 9, pt. 2, p. 261.*)

54335. ANDROPOGON sp.

Received as *Andropogon annulatus.*

54336 to 54341. ORYZA SATIVA L. Poaceæ. **Rice.**

From Saigon, Cochin China. Seeds presented by M. E. Carle, director, Laboratoire de Genetique, Institut Scientifique de l'Indochine. Received September 13, 1921. Notes adapted from *Bulletin Agricole, de l'Institut Scientifique de Saigon, vol. 2.*

54336. *Cadung.* A variety of the Gocong type, a fine grain maturing January 30, after a growing period of 152 days. Yield 1,652 kilograms per hectare (1,475 pounds per acre). (*P. 43.*)

54337. *Cadung-da.* Sown on June 14, flowered December 25, harvested March 7, after about 266 days of growth. Yield 1,080 kilograms per hectare (900 pounds per acre). (*P. 41.*)

54338. *Cadung Vinhlong.* A variety of the Gocong type. Maturity is February 17 to 25, after a growing season of 183 to 235 days from the date of sowing. The yield is 1,664 to 3,600 kilograms per hectare (1,485 to 3,213 pounds per acre). (*P. 42.*)

54339. *Tam. vuôc.* Of the Gocong type. The growing period is 164 to 179 days, and the yield 1,117 to 1,304 kilograms per hectare (997 to 1,165 pounds per acre). (*P. 42.*)

54340. *Tau chén.*

54341. *Tra bac.*

54342 and 54343. ECHINOCHLOA PYRAMIDALIS (Lam.) Hitchc. and Chase. Poaceæ. **Grass.**
(*Panicum pyramidale* Lam.)

From Loanda, Angola, Africa. Seeds presented by J. Gossweiler, through H. A. Longworth, agricultural missionary, Angola Mission, Malanzhe, Angola. Received September 16, 1921.

"Grasses of Angola, which may be useful for forage." (*Longworth.*)

A smooth, sparingly branched, somewhat fleshy annual 7 feet tall, with elongate leaves and a long tapering panicle, the relatively slender branches ascending or slightly drooping. (Adapted from *Contributions from the National Herbarium, vol. 18, p. 345.*)

For previous introduction, see S. P. I. No. 51941.

54342. "An aquatic form 3 meters (10 feet) in height." (*Gossweiler.*)

54343. "A rhizomatous aquatic or semiaquatic form, up to 4 meters (13 feet) in height." (*Gossweiler.*)

54344. ORYZA SATIVA L. Poaceæ. **Rice.**

From Saigon, Cochin China. Seeds presented by M. E. Carle, director, Laboratoire de Genetique, Institut Scientifique de l'Indochine. Received September 13, 1921.

Luá chua chan.

54345. ECHINOCHLOA HAPLOCLADA Stapf. Poaceæ. **Grass.**

From Loanda, Angola, Africa. Seeds presented by J. Gossweiler, through H. A. Longworth, agricultural missionary, Angola Mission, Malanzhe, Angola. Received September 16, 1921.

A tufted perennial up to 8 feet high, native to Nile land and Mozambique. The linear leaves are 6 inches to over a foot long, and the dense erect linear to linear-oblong panicles are 4 to 9 inches long. (Adapted from *Thiselton-Dyer, Flora of Tropical Africa, vol. 9, p. 618.*)

54346 and 54347. ORYZA SATIVA L. Poaceæ. **Rice.**

From Saigon, Cochin China. Seeds presented by M. E. Carle, director, Laboratoire de Genetique, Institut Scientifique de l'Indochine. Received September 13, 1921.

54346. *Nango.* A fine variety with somewhat elongated grain, of the Gocong type. After a growing period of 159 days it matures about January 8, with a yield of 1,496 kilograms per hectare (1,335 pounds per acre). (Adapted from *Bulletin Agricole de l'Institut Scientifique de Saigon, vol. 2, p. 43.*)

54347. *Nangngoc.* A variety with a normal growing period of 119 to 151 days usually 122 days. The normal yield is 2,000 kilograms per hectare (1,785 pounds per acre). (Adapted from *Bulletin Agricole de l'Institut Scientifique de Saigon, vol. 2, p. 41.*)

54348. ORYZA SATIVA L. Poaceæ. **Rice.**

From Loanda, Angola, Africa. Seeds presented by J. Gossweiler, through H. A. Longworth, agricultural missionary, Angola Mission, Malanzhe, Angola. Received September 16, 1921.

"Rootstock tufted, culms numerous, up to 2 meters (7 feet) high. Found with *Echinochloa stagnina* and *E. pyramidalis* in swamps which contain stagnant water up to the time of maturity of the rice. Native to the swampy margins of River Longa, Quissama, Cuanza Sul, Angola. Matures towards July." (*Gossweiler.*)

54349. ORYZA SATIVA L. Poaceæ. **Rice.**

From Saigon, Cochin China. Seeds presented by M. E. Carle, director, Laboratoire de Genetique, Institut Scientifique de l'Indochine. Received September 13, 1921.

Ra xanh. A variety originated at Dinhthoi, Cantho, very productive, but with a small short grain. The yield is from 1,769 to 3,859 kilos per hectare (1,579 to 3,444 pounds per acre) with a growing period of 202 to 218 days. Ripens February 19 to 21. (Adapted from *Bulletin Agricole de l'Institut Scientifique de Saigon, vol. 2, p. 41.*)

54350 to 54352. PANICUM spp. Poaceæ. **Panic grass.**

From Loanda, Angola, Africa. Seeds presented by J. Gossweiler, through H. A. Longworth, agricultural missionary, Angola Mission, Malanzhe, Angola. Received September 16, 1921.

"Grasses of Angola, which may be useful for forage." (*Longworth.*)

54350. PANICUM MAXIMUM Forsk.

"A robust perennial 6 feet or more tall, with short rootstocks growing in immense leafy clumps. The open panicles about a foot long bear numerous smooth, rather small oblong spikelets. Native to Guadeloupe." (*Agnes Chase.*)

For previous introduction, see S. P. I. No. 53956.

54350 to 54352—Continued.

54351. PANICUM MUTICUM Forsk.

"An annual or perennial, semiaquatic grass 1.5 meters (5 feet) in height. Native to Egypt and Arabia." (*Gossweiler.*)

54352. PANICUM sp.

"An erect annual up to 2.5 meters (8 feet) in height." (*Gossweiller.*)

Received as *Panicum synnertonii*, but the seeds received are not this species.

54353 to 54384.

From Chengtu, Szechwan, China. Seeds presented by P. M. Bayne, through J. Burtt Davy, Cambridge, England. Received September 19, 1921.

The only notes received with this shipment were the native names of the various seeds in Chinese characters. These were translated by Dr. T. Tanaka, of the Office of Crop Physiology and Breeding Investigations.

54353. AKEBIA LOBATA AUSTRALIS Diels. Lardizabalaceæ.

"(No. 20.) Eight-month *kua*."

54354. BETA VULGARIS L. Chenopodiaceæ. Beet.

"(No. 60.) Thick-skinned vegetable."

54355. BRASSICA JUNCEA (L.) Cass. Brassicaceæ. Chinese mustard.

"(No. 58.) Blue (green) vegetable."

54356. BRASSICA PEKINENSIS (Lour.) Gagn. Brassicaceæ. Pai ts'ai.

"(No. 59.) Large *Pai ts'ai*."

54357. BRASSICA sp. Brassicaceæ.

"(No. 50.) Water lily, flower white (some special name; can not be white-flowered water lily from etymology)."

54358. BRASSICA sp. Brassicaceæ.

"(No. 52.) Pink oil vegetable seed."

54359. BRASSICA sp. Brassicaceæ.

"(No. 61.) Large-headed vegetable."

54360. CACARA EROSA (L.) Kuntze. Fabaceæ. Yam bean.
(*Pachyrhizus angulatus* Rich.)

"(No. 21.) Earth *kua* fruit."

54361. CANNABIS SATIVA L. Moraceæ. Hemp.

"(No. 95.) *Hua ma tsu*. Fire hempseed."

54362. CROTALARIA sp. Fabaceæ.

"(No. 91.) Noisy-bell herb."

54363. CHAETOCHLOA ITALICA (L.) Scribn. Poaceæ. Millet.
(*Setaria italica* Beauv.)

"(No. 88.) Pink valley seed."

54364. FAGOPYRUM VULGARE Hill. Polygonaceæ. Buckwheat.

"(No. 63.) *Ch'iao tsu*."

54365. HELIANTHUS ANNUUS L. Asteraceæ. Sunflower.

"(No. 22.) Sun-pointing *ki* (very common name for sunflower)."

54366. HOLCUS SORGHUM L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)

"(No. 100.) Greasy fruit."

54353 to 54384—Continued.

54367. PERILLA FRUTESCENS (L.) Britton. Menthaceæ.
(*P. ocymoides* L.)

"(No. 87.) *Su ma.*"

54368. PERISTROPHE TINCTORIA Nees. Acanthaceæ.

"(No. 92.) *Chih chia hua.*"

54369. PHASEOLUS ANGULARIS (Willd.) W. F. Wight. Fabaceæ. **Adsuki bean.**

"(No. 41.) *Hung tou* or pink *tou.*"

54370. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean.**

"(No. 42.) *Lu tou* or green *tou.*"

54371 and 54372. PHASEOLUS CALCARATUS Roxb. Fabaceæ. **Rice bean.**

54371. "(No. 32.) Pink Pa-mountain *tou.*"

54372. "(No. 33.) Yellow Pa-mountain *tou.*"

54373. ROHDEA JAPONICA Roth. Convallariaceæ.

"(No. 93.) Myriad-years blue (very common name.)"

54374 to 54379. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

54374. "(No. 34.) Large yellow *tou.*"

54375. "(No. 35.) Large black *tou.*"

54376. "(No. 36.) Parm-skin large *tou* (large tou is soy bean)."

54377. "(No. 37.) Blue (green) skin large *tou.*"

54378. "(No. 39.) Small black *tou.*"

54379. "(No. 40.) Small yellow *tou.*"

54380. SPINACIA OLERACEA L. Chenopodiaceæ. **Spinach.**

"(No. 72.) *P'o ts'ai.*"

54381. VIGNA SESQUIPEDALIS (L.) Fruwirth. Fabaceæ. **Yard-Long bean.**

"(No. 26.) Linear berry *tou.*"

54382. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

"(No. 25.) White dewberry *tou.*"

54383 and 54384. ZEA MAYS L. Poaceæ. **Corn.**

54383. "(No. 82.) Horse-teeth jewel *mai* (barley, wheat, etc., called *mai*)."

54384. "(No. 83.) Yellow jewel *mai.*"

54385 to 54395.

From Avondale, Auckland, New Zealand. Seedlings presented by H. R. Wright. Received September 17, 1921. Quoted notes by Mr. Wright.

54385. MALUS SYLVESTRIS Mill. Malaceæ. **Apple.**
(*Pyrus malus* L.)

"No. 7. Root grafts, second-generation seedling from *Irish Peach.* This seedling is aphis resistant and has a perfect affinity for the Chinese crab, *Pyrus prunifolia.* I am using it for double working, for all those that will not do direct on prunifolia."

For previous introduction, see S. P. I. No. 31519.

54385 to 54395—Continued.

54386. MALUS PUMILA Mill. Malaceæ. **Paradise apple.**

"No. 8. Root grafts, aphis-resistant *Paradise*, used as a dwarfing stock."

For previous introduction, see S. P. I. No. 42638.

54387 to 54392. MALUS SYLVESTRIS Mill. Malaceæ. **Apple.**
(*Pyrus malus* L.)

54387. "No. 1. *Bordeaux Reinette.* New blight-proof apple, resembling *Cox's Orange* in color and shape, with a rich aromatic flavor; fruit a good keeper, making an ideal apple for home or export; heavy cropper."

54388. "No. 3. Root grafts, *Delicious* × *Cox's Orange* cross, nearly aphis resistant; a beautiful apple; an early and heavy cropper of superb quality."

54389. "No. 6. Root grafts, *Imm's Seedling.* A large culinary apple, one of the very best for that purpose; good cropper, and aphis resistant. A most promising stock; of upright growth, with very large foliage and a splendid root system."

54390. "No. 2. *Keancy's Winter;* has proved aphis resistant with me."

54391. "No. 3. Plants on own roots, grown from root cuttings of *Ribston Pippin* × *Northern Spy*, cross not yet named; aphis resistant. A superb keeper with a delicious flavor."

54392. "No. 4. A sport from the *Ribston-Spy* cross, differing only in its most peculiar color; aphis resistant. Flavor and keeping qualities superb."

54393. PRUNUS DOMESTICA L. Amygdalaceæ. **Prune.**

"No. 9. A very large black prune, early ripening, before *Petite d'Agen;* should be valuable."

54394. PRUNUS SALICINA × CERASIFERA. Amygdalaceæ. **Hybrid plum.**

"No. 11. An enormous cropper and good shipper; splendid for jam and bottling; a valuable commercial fruit, should be planted largely."

54395. PRUNUS SALICINA × CERASIFERA. Amygdalaceæ. **Hybrid plum.**

"No. 10. *Wright's Hybrid Cherry* plum × *Wright's Early Jap*, cross like cherry plum (*Prunus cerasifera*) in appearance, but larger; good alike for jam, bottling, and dessert. The tree is very upright in growth and should make a good hedge."

54396 to 54399. ARISTIDA spp. Poaceæ. **Grass.**

From Loanda, Angola Africa. Seeds presented by J. Gossweiler, through H. A. Longworth, agricultural missionary, Angola Mision, Malanzhe, Angola. Received September 16, 1921.

"Grasses of Angola found in the arid coast region and might be useful for forage in arid conditions in the United States." (*Longworth.*)

54396. ARISTIDA ADSCENSIONIS L.

"A tufted weedy annual 6 to 12 inches tall, with dense narrow panicles; the awns of the crowded spikelets are horizontally spreading." (*Agnes Chase.*)

For previous introduction, see S. P. I. No. 15334.

54397. ARISTIDA HORDEACEA Kunth.

"An annual about a foot tall, bent at the lower joints, with bushy barleylike heads about 3 or 4 inches long." (*Agnes Chase.*)

54396 to 54399—Continued.

54398. ARISTIDA PAPPOSA Trin. and Rupr.

A grayish species native to Nubia and Senegal, with smooth culms a foot or more long. The narrow rolled leaves are 3 to 6 inches long, the narrow oblong panicles 4 to 5 inches long with erect somewhat appressed branches. The awns are feathery above the middle. (Adapted from *Steudel, Synopsis Plantarum Graminearum, p. 144.*)

54399. ARISTIDA sp.

Received as *Aristida rhiniochloa* (?).

54400 to 54406.

From Loanda, Angola, Africa. Seeds presented by J. Gossweiler, through H. A. Longworth, agricultural missionary, Angola Mission, Malanzhe, Angola. Received September 16, 1921.

"Grasses of Angola which may be useful for forage."

54400. CAPRIOLA DACTYLON (L.) Kuntze. Poaceæ. Bermuda grass. (*Cynodon dactylon* Pers.)

"Found in the arid coast region and might be useful for arid conditions in the United States." (*Longworth.*)

For previous introduction, see S. P. I. No. 51335.

54401. STREPTOLOPHUS SAGITTIFOLIUS Hughes. Poaceæ.

"A tropical African annual much branched from the base. A rare grass." (*Gossweiler.*)

"Freely branching, decumbent, the blades conspicuously sagitttate on slender petioles spreading from the sheaths; inflorescence of rather long-stalked burs." (*Agnes Chase.*)

54402. ENTEROPOGON MELICOIDES (Kœnig) Nees. Poaceæ.

"Found in the arid coast region and might be useful for arid conditions in the United States." (*Longworth.*)

"A tall slender perennial with narrow leaves and a one-sided spike of crowded awned spikelets." (*Agnes Chase.*)

54403. ERAGROSTIS CHAPELLIERI (Kunth) Nees. Poaceæ.

"A wiry perennial 2 to 3 feet tall, with narrow leaves and russet-colored narrow panicles 2 to 6 inches long. Native to Madagascar." (*Agnes Chase.*)

54404. ERAGROSTIS FASCICULARIS Trin. Poaceæ.

A densely tufted species with strong roots, native to the Guinea Coast. The culms bear distant clusters of straight branches. The smooth leaves are narrow and rolled, and the panicles are narrow and dense. (Adapted from *Steudel, Synopsis Plantarum Graminearum, p. 270.*)

54405. NAZIA ALIENA (Spreng.) Scribn. Poaceæ.

"Found in the arid coast region and might be useful for arid conditions in the United States." (*Longworth.*)

"A low annual with rather short, broad, conspicuously ciliate leaves and spikes 1 to 4 inches long of minute burs, the bur falling entire." (*Agnes Chase.*)

54406. VETIVERIA NIGRITANA (Benth.) Stapf. Poaceæ.

"A robust perennial growing in clumps, with elongate panicles of slender whorled branches with prickly spikelets toward the ends. Differs from the common species in having delicate awns." (*Agnes Chase.*)

54407 to 54409.

From Chengtu, Szechwan, China. Seeds presented by P. M. Bayne, through J. Burtt Davy, Cambridge, England. Received September 19, 1921.

The only notes received with these seeds were the native names in Chinese characters. These were translated by Dr. T. Tanaka, of the Office of Crop Physiology and Breeding Investigations.

54407. AMARANTHUS PANICULATUS L. Amaranthaceæ.

No. 86. "Savage's chestnut."

54408. CUCURBITA sp. Cucurbitaceæ.

No. 12. "Winter *kua*."

54409. IPOMOEA REPTANS (L.) Poir. Convolvulaceæ. (*I. aquatica* Forsk.)

No. 49. "*Yung* vegetable."

54410. ZEA MAYS L. Poaceæ. Corn.

From Supe, Peru. Seeds presented by Thomas W. Voetter, American consul. Received September 16, 1921.

"In December, 1919, I obtained an ear of corn at Supe, Peru. Part of this was planted at Antofagasta, Chile, and gave very satisfactory results. The plant grew very tall, and on some of the stalks four ears appeared. The ears were long and the grains tender, juicy, and sweet.

"Some of the grains from the original ear were sent to Fort Wayne, Ind., and planted there in 1920, but no ears formed there before the coming of frost. It is evident that this variety needs a long growing season and might do very well and prove very satisfactory in some southern State." (*Thomas W. Voetter.*)

54411 to 54424. BRASSICA spp. Brassicaceæ.

From Okitsu, Shizuokaken, Japan. Seeds presented by Dr. T. Onda, director, Imperial Horticultural Experiment Station, through T. Ito, chief, Plant Industry Division, Imperial University of Agriculture and Commerce, Tokyo. Received September 30, 1921.

New and rare types of salad plants and green vegetables, etc. Notes adapted from Inouma, Japanese Mustards; translated by T. Tanaka, of the Office of Crop Physiology and Breeding Investigations.

54411. *Hatakena* (farm vegetable), from Kyoto Province, much resembles *aburana*, the common oil vegetable, but is paler. It is commonly used as a kind of salad. The yellow flowers are three-quarters of an inch across and bear four light-green honey glands. The radical leaves resemble those of daikon (*Raphanus sativus*). The many-seeded pods are 4½ inches long.

54412. *Hinona* (vegetable of Hino), from Shigaken. A plant produced in the village of Hino, Omi Province, with leaves like *aburana* and a little longer, the larger veins showing reddish purple. The root, 5 to 7 inches in circumference and 7 to 8 inches long, is a beautiful purplish red. The yellow petals are rounder than those of *aburana*.

54413 to 54415. A variety with sparingly incised leaves and white stalk called *Mibuna* from the name of the village where it originated, in the vicinity of Kyoto. The leaves are soft and of good flavor and are highly esteemed.

54413. *Mibuna* (common).

54414. *Mibuna, okute* (late).

54415. *Mibuna, wase* (early).

54411 to 54424—Continued.

54416 to 54419. *Midzuna* (water vegetable). A variety with several hundred tufted leaves growing from one root; several flower stalks grow up between the leaves. In general character the plant resembles *aburana* except that the deeply incised serrate leaves are more slender and the small slender pods are round instead of flat. This variety is commonly planted in Mino Province and is called *seneuzi* (thousand fibers) in the city of Kyoto.

54416. *Midzuna, nakate* (midseason).

54417 and 54418. *Midzuna, okute.* A large coarse variety of *midzuna* which is planted in autumn. The leaves are deeply incised but not so slender as those of the common *midzuna.* It tastes slightly bitter like *midzuna* but is without the disagreeable odor of *takana.*

54417. *Midzuna, okute* (late).

54418. *Midzuma, okute dai* (late and large).

54419. *Midzuna, wase* (early).

54420. *Suigukina.* A variety extensively cultivated at Kamo Village, Yamashiro Province, and mostly used to make "aemono" (mixed salad). The plant is similar to *aburana* except that the radical leaves somewhat resemble those of *midzuna* and the stem leaves have much deeper incisions. The yellow flowers are 1¼ inches across.

54421 to 54424. *Takana.*

54421. *Takana* (common). A plant 3 to 4 feet high, with large stiff blunt-tipped leaves. In spring the stems and leaves are picked and eaten, therefore the name *kakina* (picked vegetable) or *takana.* It has a pungent taste and when boiled has a bad odor. The flowering season follows the ordinary *karashina.*

54422. *Takana, katsnona* (especially delicious one). For description, see S. P. I. No. 54421.

54423. *Takana, murasaki* (purple variety). Similar in general appearance to *takana* (common) but with incised sharply serrate leaves of a purplish color. The taste is less pungent than that of *takana.*

54424. *Takana, shiro* (white). For description, see S. P. I. No. 54421.

54425. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

From Mongalla, Anglo-Egyptian Sudan. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received December 9, 1920. Numbered September, 1921.

"(No. 1488. Mongalla, Anglo-Egyptian Sudan. August 8, 1920.) Dark hull, not awned." (*Shantz.*)

INDEX OF COMMON AND SCIENTIFIC NAMES.

Acorn, *Dioscorea latifolia*, 53925, 54054.
Akebia lobata australis, 54353.
Allium fistulosum, 53958.
Amaranth. See *Amaranthus* spp.
Amaranthus gangeticus, 53896.
paniculatus, 53897, 54407.
Ananas sativus, 53990.
Andropogon sp., 54335.
fastigiatus, 54333.
gayanus, 54334.
Anthyllis vulneraria, 53920.
Apple, *Malus sylvestris*:
Admirable de Otoño, 54299.
Bordeaux Reinette, 54387.
Citronelle, 54302.
Delicious × Cox's Orange, 54388.
Huidobro, 54300.
Imm's Seedling, 54389.
Irish Peach, 54385.
Keaney's Winter, 54390.
Productiva, 54301.
Ribston Pippin × Northern Spy, 54391.
Spy, 54392.
Apple, crab, *Malus* spp., 54082–54094. 54266–54268.
Paradise, *Malus pumila*, 54386.
Aristida sp., 54399.
adscensionis, 54396.
hordeacea, 54397.
papposa, 54398.
Attalea cohune, 54017.
Avena sativa, 54326.
Avocado, *Persea americana:*
Capac, 54276.
Carchi, 54273.
Chota, 54272.
Egas, 54271.
Huira, 54278.
Inca, 54277.
Imbabura, 54275.
Irumina, 54274.
Tamayo, 54270.

Balsa, *Ochroma lagopus*, 54332.
Bamboo, *Dendrocalamus* spp., 53909, 54045, 54311.
Barberry, *Berberis* spp., 54061–54074, 54269.
Bean, adsuki, *Phaseolus angularis*, 54369.
common, *Phaseolus vulgaris*, 53969.
Lima, *Phaseolus lunatus*, 54053.
mung, *Phaseolus aureus*, 54370,
rice, *Phaseolus calcaratus*, 54371–54372.
Bean, soy, *Soja max*, 53930–53939, 53987, 54374–54379.
yam, *Cacara erosa*, 54360.
Yard-Long, *Vigna sesquipedalis*, 54381.
Beet, *Beta vulgaris*, 53959, 54354.
Berberis aggregata, 54061
amurensis, 54062.
japonica, 54063.
brachypoda, 54064.
dictyophylla, 54065.
dielsiana, 54066.
gilgiana, 54067
henryana, 54068.
koreana 54069.
lucida, 54070.
quinduensis, 54269.
serotina, 54071.
sieboldii, 54072.
thunbergii maximowiczii, 54073.
vernae, 54074.
Beta vulgaris, 53959, 54354.
Blackberry, *Rubus adenotrichos*, 53995, 54279, 54280.
Black medic, *Medicago lupulina*, 53981.
Brassica spp., 53962–53966, 53974, 54357–54359, 54411–54424.
juncea, 53960, 54355.
pekinensis, 53961, 54356.
Buckwheat, *Fagopyrum vulgare*, 54364.
Burnet, *Sanguisorba minor*, 53921.

Cacara erosa, 54360.
Canna edulis, 53944.
Cannabis sativa, 54361.
Capriola dactylon, 54400.
Capsicum annuum, 53941–53943.
Carica papaya, 54330.
Carissa carandas, 54043.
Casimiroa sp., 54046.
edulis, 54051.
Cassia sp., 54037.
alata, 54322.
tomentosa, 54036.
Castanopsis javanica. See *Quercus javanica*.
Catalpa bungei, 53989.
Centaurea canariensis, 53910.
ragusina, 53911, 54331.
Chaetochloa italica, 53947, 53948, 54363.
Chenopodium album, 53898.
Chih chia hua, *Peristrophe tinctoria*, 54368.
Chrysanthemum coronarium, 53967.

Citrus sp., 53955.
Clitoria ternatea, 53988.
Clover, cluster, *Trifolium glomeratum*, 53985.
Sicilian, *Trifolium panormitanum*, 54032.
strawberry, *Trifolium fragiferum*, 53913.
subterranean, *Trifolium subterraneum*, 53914.
white, *Trifolium repens*, 53912.
Clusia grandiflora, 54306.
Coconut, *Cocos nucifera*, 53922.
Cocos nucifera, 53922.
Cohune, *Attalea cohune*, 54017.
Coix lacryma-jobi ma-yuen, 54310.
Cola nitida, 54307.
Coleus rotundifolius, 54321.
tuberosus. See *C. rotundifolius*.
Colocasia esculenta, 53980.
Corn, *Zea mays*, 54317, 54318, 54383, 54384, 54410.
Cotoneaster dielsiana, 54075.
foveolata, 54076.
Couepia sp., 53929.
floccosa, 54050.
Cowpea, *Vigna sinensis*, 54382.
Crab apple, *Malus* spp., 54082–54094, 54266–54268.
wild, *Malus coronaria*, 54268.
Crataegus arkansana, 54077.
coccinioides, 54164.
dawsoniana, 54079.
lavallei, 54078.
nitida, 54080.
prunifolia, 54081.
Crinodendron patagua, 54303.
Crotalaria spp., 53926, 53927, 54362.
Cucumber, *Cucumis sativus*, 53968.
Cucumis melo, 53899–53901.
sativus, 53968.
Cucurbita sp., 54408.
Currant, *Ribes* sp., 53994.
Cynodon dactylon. See *Capriola dactylon*.

Datura rosei, 54049.
suaveolens, 53919.
Dendrocalamus hamiltonii, 53909.
longispathus, 54045, 54311.
Dioclea lasiocarpa, 54323.
Dioscorea alata, 54057.
batatas, 54048.
esculenta, 53924, 54055, 54309.
latifolia, 53925, 54054.
trifida, 53996, 54056.
Diospyros lycopersicon, 54047.

Echinochloa haploclada, 54345.
pyramidalis, 54342, 54343.
Eggplant, *Solanum melongena*, 53977.
Elaeis guineensis, 54039, 54040.
Enteropogon melicoides, 54402.
Eragrostis chapellieri, 54403.
fascicularis, 54404.
Fagopyrum vulgare, 54364.
Fountain tree, *Spathodea campanulata*, 53983.
Fuchsia sp., 53991.

Ginger, *Zinziber* sp., 53946.
Gladiolus alatus, 54304.
Glycine hispida. See *Soja max*.
Gourd, *Luffa* spp., 53902, 53903.
Grass, beard, *Andropogon* spp., 54333–54335.
Bermuda, *Capriola dactylon*, 54400.
buffels, *Panicum maximum*, 53956.
Enteropogon, melicoides, 54402.
guinea, *Panicum maximum*, 53956, 54350.
kangaroo, *Themeda triandra*, 54044.
Nazia aliena, 54405.
panic, *Panicum* spp., 54350–54352.
Streptolophus sagittifolius, 54401.
Urochloa brachyura, 53957.
Vetiveria nigritana, 54406.
See also *Aristida* spp., *Echinochloa* spp., and *Eragrostis* spp.

Hawthorn, *Crataegus* spp., 54077–54081, 54164.
Helianthus annuus, 54365.
Hemp, *Cannabis sativa*, 54361.
Hippeastrum rutilum, 54042.
Holcus sorghum, 54366, 54425.
Honeysuckle, *Lonicera syringantha*, 54058.
Huantuc, *Datura* sp., 54049.
Hung-tou mu, *Ormosia hosiei*, 54033.
Hydnocarpus wightiana, 54319.

Ipomoea aquatica. See *I. reptans*.
ficifolia, 54038.
reptans, 54409.

Karanda, *Carissa carandas*, 54043.

Leptospermum scoparium nichollii, 53928.
Lonicera syringantha, 54058.
Luffa acutangula, 53902.
cylindrica, 53903.
aegyptiaca. See *L. cylindrica*.
Lycopersicon esculentum, 53940, 53951–53954, 53984.

Malus sp., 54267.
arnoldiana, 54082.
baccata, 54266.
jackii, 54083.
coronaria, 54268.
ioensis, 54084.
micromalus, 54085.
prunifolia rinki, 54086.
pumila, 54386.
robusta, 54087.
sargentii, 54088.
scheideckeri, 54089.

Malus sieboldii arborescens, 54090.
sylvestris, 54299–54302, 54385, 54387–54392.
theifera, 54091.
transitoria toringoides, 54092.
zumi, 54093, 54094.
Mangifera indica, 54041.
Mango, *Mangifera indica*, 54041.
Ma-yuen, *Coix lacryma-jobi ma-yuen*, 54310.
Medicago lupulina, 53981.
Millet, *Chaetochloa italica*, 53947, 53948, 54363.
Mirabilis jalapa, 53904.
Morning-glory, *Ipomoea ficifolia*, 54038.
Mortiño, *Vaccinium floribundum*, 54281.
Muskmelon, *Cucumis melo*, 53899–53901.
Mustard, *Brassica* spp., 53962–53966, 53974.
Chinese, *Brassica juncea*, 53960, 54355.
Myrica rubra, 53982.

Nageia spp. 54327–54329.
Nazia aliena, 54405.

Oats, *Avena sativa*, 54326.
Oca, *Oxalis tuberosa*, 54316.
Ochna squarrosa, 54324.
Ochroma lagopus, 54332.
Ocimum sanctum. See *O. tenuiflorum*.
tenuiflorum, 53905.
Onion, Welch, *Allium fistulosum*, 53958.
Ormosia hosiei, 54033.
Oryza sativa, 53978, 54282–54296, 54336–54341, 54344, 54346–54349.
Oxalis tuberosa, 54316.

Pachyrhizus angulatus. See *Cacara erosa*.
Pai ts'ai, *Brassica pekinensis*, 53961, 54356.
Palm, coconut, *Cocos nucifera*, 53922.
cohune, *Attalea cohune*, 54017.
nikau, *Rhopalostylis sapida*, 54298.
oil, *Elaeis guineensis*, 54039, 54040.
Panicum sp., 54352.
maximum, 53956, 54350.
muticum, 54351.
pyramidale. See *Echinochloa pyramidalis*.
Papaya, *Carica papaya*, 54330.
Passiflora ligularis, 54035.
macrocarpa, 54034.
Patagua, *Crinodendron patagua*, 54303.
Paullinia cupana, 54305.
Pea, field, *Pisum arvense*, 53970.
garden, *Pisum sativum*, 53917.
Pear, *Pyrus* spp., 54095–54103.
Pepper, red, *Capsicum annuum*, 53941–53943.
Perilla frutescens, 54367.
ocymoides. See *P. frutescens*.
Peristrophe tinctoria, 54368.
Persea americana, 54270–54278.
gratissima. See *P. americana*.
Petrea volubilis, 54325.
Phaseolus angularis, 54369.
aureus, 54370.
calcaratus, 54371, 54372.
lunatus, 54053.
vulgaris, 53969.
Phleum pratense, 53986.
Pineapple, *Ananas sativus*, 53990.
Pisum arvense, 53970.
sativum, 53917.
Plum, *Prunus glandulosa*, 54028.
hybrid, *P. salicina* × *cerasifera*, 54394, 54395.
Podocarpus spp. See *Nageia* spp.
Polyalthia longifolia, 53923.
Potato, *Solanum* spp., 54059, 54060, 54312–54315.
Poterium sanguisorba. See *Sanguisorba minor*.
Prune, *Prunus domestica*, 54393.
Prunus domestica, 54393.
glandulosa, 54028.
salicina × *cerasifera*, 54394, 54395.
Pyrus baccata. See *Malus baccata*.
betulaefolia, 54095.
calleryana, 54096.
graciliflora, 54097.
tomentella, 54098.
coronaria. See *Malus coronaria*.
malus. See *Malus sylvestris*.
michauxii, 54099.
nivalis, 54100.
phaeocarpa globosa, 54101.
salicifolia, 54102.
serrulata, 54103.

Quercus javanica, 54308.

Radish, *Raphanus sativus*, 53971–53973, 53975, 53976.
Raphanus sativus, 53971–53973, 53975, 53976.
Raspberry, *Rubus* sp., 53945.
Rheedia edulis, 54052.
Rhopalostylis sapida, 54298.
Ribes punctatum, 53994.
Rice, *Oryza sativa*, 53978, 54282–54296, 54336–54341, 54344, 54346–54349.
Rohdea japonica, 54373.
Rosa spp., 54159–54163, 54250–54265.
abietina, 54104.
acicularis, 54105, 54165.
bourgeauiana, 54166.
engelmannii, 54106, 54167.
gmelini, 54168.
nipponensis, 54169.
alba, 54107, 54170.
alberti, 54108, 54171.
amblyotis, 54109, 54172.
arvensis, 54110, 54173.
baicalensis, 54111.
baltica, 54174.
belgradensis, 54175.
bella, 54176.

Rosa blanda, 54112, 54177, 54178.
borbonica, 54179.
californica, 54113, 54180.
canina, 54114–54117, 54181–54183.
carelica. See *R. acicularis gmelini*.
carolina, 54184, 54185.
caudata, 54118, 54186.
chaberti, 54187.
chinensis manetti, 54119.
chinensis* × *noisettiana, 54188.
cinnamomea [L. 1753], 54120, 54189.
cinnamomea [L. 1759]. See *R. majalis*.
cinnamomea malyi, 54190.
coriifolia, 54121.
cuspidata, 54122, 54191.
damascena, 54123, 54192.
davurica, 54124, 54193.
deseglisei, 54125, 54194.
dumetorum, 54126.
engelmannii. See *R. acicularis engelmannii*.
fedtschenkoana, 54195.
fendleri, 54127, 54196.
ferox, 54128, 54197.
ferruginea, 54198.
foliolosa, 54129.
gallica, 54130, 54199, 54200.
gallica × *canina*, 54201.
gallica officinalis, 54131.
gallica × (?), 54202–54204.
gayiana, 54132.
glauca, 54205–54207.
glutinosa, 54208.
gymnocarpa, 54133.
heliophila, 54209.
alba, 54134.
hibernica, 54210.
involuta, 54211.
jackii, 54135, 54212.
jundzilli, 54136, 54213.
macrantha, 54214.
majalis, 54137, 54215.
malyi. See *R. cinnamomea malyi*.
manca, 54216.
micrantha, 54138, 54217.
montana, 54139, 54218.
moschata nastarana, 54219.
multibracteata, 54220.
multiflora, 54221.
multiflora cathayensis, 54140.
multiflora* × *chinensis, 54222.
nutkana, 54141.
ochroleuca. See *R. spinosissima luteola*.
omissa, 54223.
oxyodon, 54142, 54224, 54225.
palmeri, 54143.
palustris, 54144, 54226.
pendulina. See *R. cinnamomea* [L. 1753].
pisocarpa, 54145, 54227.
pissarti. See *R. moschata nastarana*.
Rosa polyantha. See *R. multiflora* × *chinensis*.
pouzini, 54146.
provincialis. See *R. gallica officinalis*.
rubiginosa, 54147.
rubrifolia, 54228.
rugosa chamissoniana, 54148.
rugosa × *ferruginea*, 54230.
kamchatica, 54149, 54229.
sabini. See *R. involuta*.
saturata, 54231.
sayi. See *R. acicularis bourgeauiana*.
sertata, 54150.
setipoda, 54232.
spinosissima, 54151, 54233–54235.
altaica, 54152, 54236.
hispida, 54153, 54237.
luteola, 54238.
spinosissima × (?), 54239.
stellata, 54154.
sweginzowii, 54240.
turkestanica, 54241.
tuschetica, 54155.
venosa, 54242.
villosa, 54156, 54157, 54243, 54244.
webbiana, 54245.
wichuraiana × (?), 54246.
willmottiae, 54247.
woodsii, 54158, 54248.
xanthina, 54249.
Rose, Apothecary's *Rosa gallica* × (?), 54202.
Beranger, *Rosa gallica* × (?), 54203.
Bourbon, *Rosa borbonica*, 54179.
cinnamon, *Rosa majalis*, 54137, 54215.
Crested Province, *Rosa gallica* × (?), 54204.
damask, *Rosa damascena*, 54123, 54192.
dog, *Rosa canina*, 54114–54117, 54181–54183.
Scotch, *Rosa spinosissima*, 54151, 54233–54235.
Rubus spp., 53945, 54320.
adenotrichos, 53995, 54279, 54280.
Rumex maritimus, 53906.
vesicarius, 53907.

Saccharum officinarum, 53949, 53950, 53997–54016, 54018–54027.
Sage, *Salvia sagittata*, 53992.
Salvia sagittata, 53992.
Sanguisorba minor, 53921.
Sapote, white, *Casimiroa* spp., 54046, 54051.
Setaria italica. See *Chaetochloa italica*.
Soja max, 53930–53939, 53987, 54374–54379.
Solanum sp., 54060.
brevifolium, 53993.
melongena, 53977.
tuberosum, 54059, 54312–54315.

Sorghum, *Holcus sorghum*, 54366, 54425.
vulgare. See *Holcus sorghum*.
Spathodea campanulata, 53983.
Spinach, *Spinacia oleracea*, 54380.
Spinacia oleracea, 54380.
Sterculia nitida. See *Cola nitida*.
Stevia rebaudiana, 53918.
Streptolophus sagittifolius, 54401.
Sugar cane, *Saccharum officinarum:*
Chunnee, 54002.
Kassoer, 54027.
Manjay, 53949.
No. 36 POJ, 54018.
No. 100 POJ, 54019.
No. 139 POJ, 54020.
No. 213 POJ, 54021.
No. 228 POJ, 54022.
No. 862 POJ, 54023.
No. 920 POJ, 54001.
No. 979 POJ, 54024.
No. 1228 POJ, 54025.
No. 1376 POJ, 53997.
No. 1410 POJ, 54000.
No. 1499 POJ, 54010.
No. 1507 POJ, 53998.
No. 1984 POJ, 54011.
No. 2182 POJ, 54007.
No. 2206 POJ, 54008.
No. 2210 POJ, 54009.
No. 2233 POJ, 54016.
No. 2336 POJ, 54012.
No. 2366 POJ, 54013.
No. 2367 POJ, 54015.
No. 2379 POJ, 54026.
No. 2631 POJ, 53999.
No. 2655 POJ, 54005.
No. 2688 POJ, 54014.
No. 2690 POJ, 54004.
Striped Mauritius, 53950.
Yontanzan, 54006.
Zwinga, 54003.
Sunflower, *Helianthus annuus*, 54365.
Sweetbrier, *Rosa rubiginosa*, 54147.

Taro, *Colocasia esculenta*, 53980.
Themeda forskalii. See *T. triandra*.
triandra, 54044.
Timothy, *Phleum pratense*, 53986.
Tomato, *Lycopersicon esculentum*, 53940, 53951–53954, 53984.
Trefoil, yellow, *Medicago lupulina*, 53981.
Trichosanthes anguina, 53908.
Tricuspidaria dependens. See *Crinodendron patagua*.
Trifolium fragiferum, 53913.
glomeratum, 53985.
panormitanum, 54032.
repens, 53912.
subterraneum, 53914.
Triticum aestivum, 53915, 53916, 53979, 54029–54031.
vulgare. See *T. aestivum*.

Urochloa brachyura, 53957.

Vaccinium floribundum, 54281.
Vetch, kidney, *Anthyllis vulneraria*, 53920.
Vetiveria nigritana, 54406.
Vigna sesquipedalis, 54381.
sinensis, 54382.

Warszewiczia coccinea, 54297.
Wheat, *Triticum aestivum*, 53915, 53916, 53979, 54029–54031.

Yam, Chappellier, *Dioscorea batatas*, 54048.
greater, *Dioscorea alata*, 54057.
lesser, *Dioscorea esculenta*, 53924, 54055, 54309.
Yampi, *Dioscorea trifida*, 53996, 54056.
Yang mae, *Myrica rubra*, 53982.
Yellowwood, *Nageia* spp., 54327–54329.

Zea mays, 54317, 54318, 54383, 54384, 54410.
Zinziber sp., 53946.

Issued October, 1923.

U. S. DEPARTMENT OF AGRICULTURE.

BUREAU OF PLANT INDUSTRY.

INVENTORY

OF

SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM OCTOBER 1 TO DECEMBER 31, 1921.

(No. 69; Nos. 54426 to 54676.)

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CONTENTS.

	Page.
Introductory statement	1
Inventory	7
Index of common and scientific names	39

ILLUSTRATIONS.

	Page.
PLATE I. The mamoncillo, a neglected fruit tree of tropical America. (*Melicocca bijuga* L., S. P. I. No. 54521)	22
II. A relative of the papaya. (*Carica* sp., S. P. I. No. 54529)	22
III. A neglected fruit of tropical America. (*Spondias mombin*, L., S. P. I. No. 54532)	22
IV. The capuchin orange of Chile. (*Citrus sinensis* (L.) Osbeck, S. P. I. No. 54651)	22
V. Fruits of the capuchin orange, natural size. (*Citrus sinensis* (L.) Osbeck, S. P. I. No. 54651)	32
VI. The lucma, a popular fruit in Chile. (*Lucuma obovata* H. B. K., S. P. I. No 54653)	32
FIGURE 1. Map of Central America and South America, showing Wilson Popenoe's exploration routes from 1919 to 1921	2

INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM OCTOBER 1 TO DECEMBER 31, 1921 (NO. 69; NOS. 54426 TO 54676).

INTRODUCTORY STATEMENT.

Since these inventories were started, over 23 years ago, there has been such a delay in their appearance in type that the plants chronicled therein were in the hands of the experimenters long before they could read the accounts of the plants which had been sent them.

The last plant which is here recorded reached Washington December 29, 1921, and has still to be propagated before it can be sent out; it is to be hoped that before it goes out next spring a printed description of it will have appeared.

With the exception of a small number of Chilean plants secured by Mr. Popenoe just at the close of his last expedition (fig. 1), all of the plants described in this inventory were sent in by friends of plant introduction scattered over the world.

The success of the Japanese and Indian bamboos in the Southern States makes Mr. Hole's introduction of two forms which have not hitherto been established of interest to a wider public than heretofore; these are *Dendrocalamus brandisii* (No. 54429), which grows to 120 feet and has thick-walled culms, and *Melocanna baccifera* (No. 54430), a low-growing form 30 to 50 feet high, which bears fruits the size of a small pear. It is likely that these will prove of more value in Panama, Porto Rico, and Hawaii than anywhere else.

Mr. Dunbar, who is the first in America to have fruited out the half-evergreen oak, *Quercus serrata*, and who considers this tree one of the most ornamental of the Japanese species, sends us for distribution seeds (No. 54433) from his tree in Rochester, N. Y.

Dr. Gustavus Eisen, well known for his pioneer work in the early days of grape and fig introduction in California, has secured through his friend, Mr. Kouchakji, an interesting peach (No. 54441) from Baalbek and three of the famous Aleppo varieties of apricot (Nos. 54442 to 54444), which can not fail to interest Californians.

It is a long time since we have received anything from Doctor Fenzi, known to Californians as Doctor Franceschi, and it is a pleasure to call attention to a new melon (No. 54445) which he sends in from an oasis 10 miles west of Tripoli and which he remarks has hardly any cavity, but is an exceedingly juicy, delicately perfumed variety with greenish white flesh.

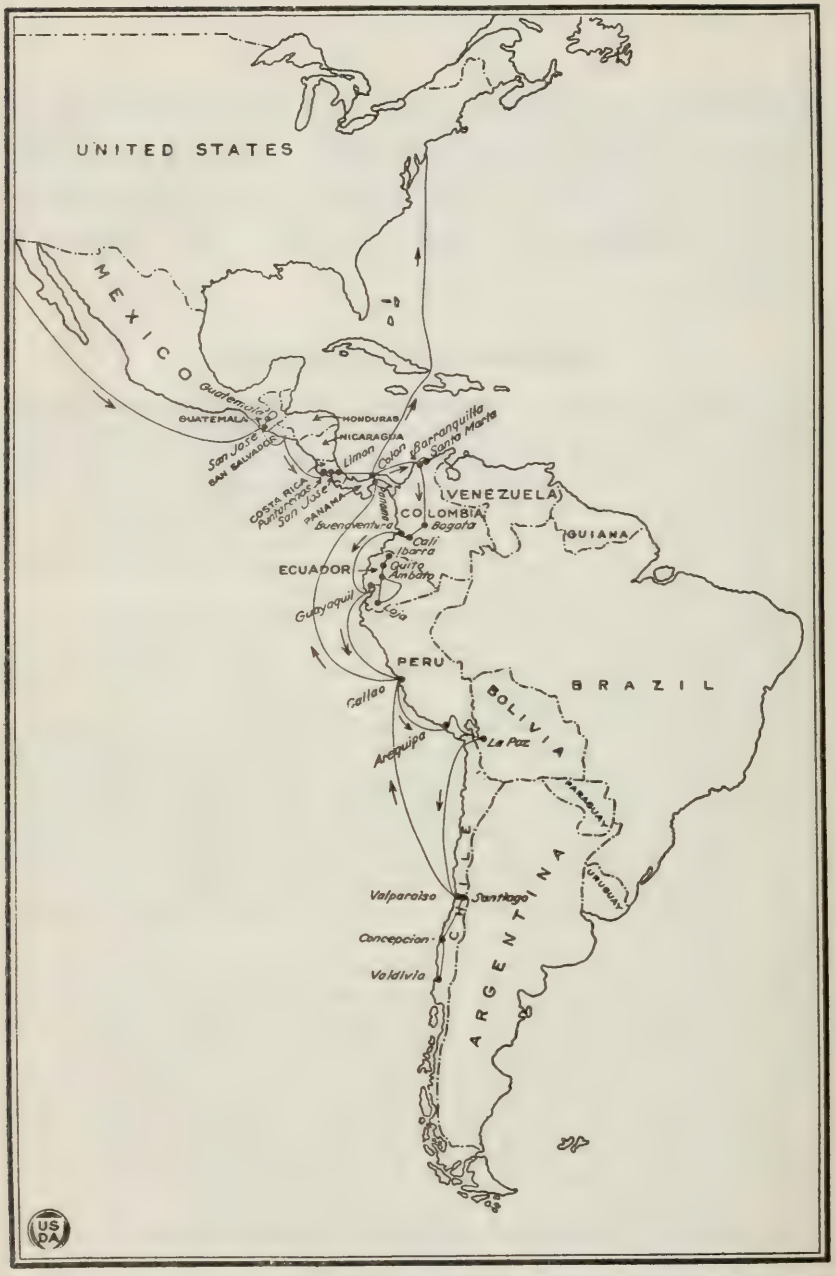


FIG. 1.—Map of Central America and South America, showing Wilson Popenoe's exploration routes from 1919 to 1921. A wealth of new plant material resulted from this trip, including the giant Colombian berry from near Bogota; the Andes berry, many varieties of which are found from Guatemala to Chile; the pejibaye, a staple food of Costa Rica; a number of choice avocados from the Chota Valley, north of Ibarra, Ecuador; several relatives of the papaya; and a host of other plants recorded in this and the four preceding inventories.

Mr. Breakwell, of Sydney, New South Wales, sends two strains of sweet sorghum (Nos. 54435 and 54436), which, when grown under Australian conditions side by side with American varieties of which he imported seeds, were much superior to the latter.

M. Goffart, of Tangier, Morocco, who has made a specialty of acacias for many years, sends us *Acacia pycnantha* (No. 54439), which he finds less intolerant of lime in the soil than any other species, although it is not so hardy. This species ought to do well in Florida, where many species of Acacia fail.

The success which has attended the use of the native species, *Agati* (*Sesbania*) *macrocarpa*, in the Coachella Valley of California has made it seem advisable to try the Indian species *A. grandiflora* (No. 54468), which, although growing into a good-sized tree, has the characteristic of developing its root nodules when quite young and thus suiting itself to use as a green soiling crop. Doctor Lyon, of Hawaii, who sends in the seeds, reports that this species has been so used there by planting thickly and turning under when 4 to 6 feet high.

Most species of Eucalyptus are too tender for cultivation in northern Florida and most parts of California, but *E. gunnii* (No. 54469), the Tasmanian eucalypt, has stood temperatures of 22° F. without the least injury and should be utilized in those localities which are too cool for the other species.

Garcinia spicata (No. 54470) from peninsular India will be a valuable thing if the true mangosteen can be grafted on it and if it will grow better than those other species which we have introduced for stock purposes.

The Ohia tree, *Caryophyllus malaccensis* (Nos. 54489 and 54530), as it grows in Panama is a superb ornamental tree even though one must stand under it to see the superbly beautiful rose-pink flowers which form on the larger branches and are partly hidden by the dark-green foliage. Though perhaps not a really first-rate fruit tree, it deserves to be grown wherever possible for its flowers.

The successful acclimatization of the kafir orange, *Strychnos spinosa*, in southern Florida, where its fruits are beginning to be appreciated, makes the introduction of another species of this genus (*Strychnos* sp., No. 54503) of more than usual interest, for it may be possible now to improve this wild fruit which lacks only quality and a knowledge of how to ripen it to make it a plant well worth cultivating in dooryards.

The demand for a timber which the teredos and white ants will not attack should make of particular interest the cultivating of the stringy bark eucalypt, *Eucalyptus obliqua* (No. 54506).

The unusual behavior of hybrids should entitle the Worcester berry (*Ribes nigrum* × *reclinatum*, No. 54507), which is a cross between the gooseberry and the black currant, to a wide trial, particularly since it is said to be a regular bearer and a very vigorous shrub.

Mr. Harrison, of Burringbar, New South Wales, has sent us again some interesting new plants, among them the Congo grass (*Pennisetum purpureum* (No. 54513), a variety of the elephant grass better than the type; it yields permanent fields of fodder on dry soils. He also sends a selected large-fruited variety of the poha, *Physalis peruviana* (No. 54514).

For some time the desirability of a dwarf mango has been felt by the Florida growers, and the introduction of the Père Louis (No. 54526), a new one from Port of Spain, Trinidad, should be of especial interest to mango growers.

A form of the cereal called Job's-tears, the seeds of which, instead of being so hard that they are useful only as beads, are soft when roasted or boiled like rice or pearl barley, should be called to the attention of tropical agriculturists. We are indebted to Mr. Wester for seeds (Nos. 54454 and 54455).

The improvement of the common papaya through hybridization has not, so far as I am aware, been attempted, although there are several unidentified species of Carica which might contribute to the problem. My son, Graham Fairchild, found on the banks of the Rio Pescado in Panama (No. 54529) what appears to be a species quite similar to one found by Mr. Popenoe in Costa Rica.

The yellow mombin, *Spondias mombin*, seems to be as popular a fruit with the children of the Canal Zone as the Wildgoose plums were with the descendants of the pioneers on the Great Plains; but, notwithstanding the fact that the trees bear fruit varying greatly in quality, nothing seems yet to have been done to improve this fruit tree. Seeds (No. 54532) were imported from Panama to see if the species will grow in Florida.

The Chorisia of Paraguay (*C. speciosa*, No. 54551), which is reported to be a tree that will stand more cold than the kapok tree of Java and yields a silky fiber similar to the best kapok, should be thoroughly tried out in our island possessions and even in southern Florida.

The shisham of British India, *Amerimnon latifolium* (Nos. 54554 and 54555), because of its habit of suckering and its great vigor, enabling it to compete with other forest trees, as well as because it produces timber of excellent quality, deserves to be called to the attention of tropical foresters.

During his brief visit to Chile Mr. Popenoe spent some time with the veteran horticulturist of Chile, Sr. Salvador Izquierdo, of Santa Ines, who has one of the most remarkable collections of plants of horticultural interest in all South America. Thanks to Señor Izquierdo's kindness, we are in possession of some very interesting plants, among them being four varieties of peach of Chilean origin and of excellent quality (Nos. 54622 to 54625); seven interesting native trees, including the Belloto (No. 54627), the Patagua (No. 54628), the Laurel de Chile (No. 54633), the Litre (No. 54634), the Tipu (No. 54643), the Boldo (No. 54639), and the Peumo (No. 54629); a collection of strictly Chilean strawberries (Nos. 54630 and 54631) of the *Fragaria chiloensis* group; also the Huidobro apple (No. 54635), which he has found resistant to the worst insect pest of apples in Chile, the woolly aphis; and the so-called evergreen poplar (No. 54641), which is one of his selections from the common species of poplar of that region.

Mr. Popenoe calls attention to what appears to be a true dwarf orange (No. 54651) found growing in Señor Izquierdo's nursery, which, because of its dwarf habit and the quality of its fruits, he considers promising for dooryard plantings; also to the little-known species of fruit tree, *Lucuma obovata* (No. 54653), which is a popu-

lar fruit in central Chile; it resembles the well-known ti-es already grown in southern Florida, but is much larger.

The collections of F. A. McClure, of the Canton Christian College, are particularly interesting since they were made in Annam, French Indo China, a territory little explored and from which very little material has been received. They include the yan min (*Dracontomelon sinense*, No. 54655), a new fruit tree; two undetermined species of Garcinia (Nos. 54656 and 54657), relatives of the mangosteen, with fruits reminding one of the latter; and the interesting citrus relative, *Severinia buxifolia* (No. 54658), which can stand large amounts of salt in the soil, is suitable for hedges, and appears to be a promising plant for this purpose even if it should not prove of particular value for breeding.

We are again indebted to Doctor Proschowsky, of Nice, France, for a collection of seeds (Nos. 54664 to 54669) from his various Butias, which he calls his fruit palms, and which should certainly be thoroughly tested in those portions of the United States where they are likely to grow. Any fruit-bearing palm adapted to the pinelands of northern Florida would be of considerable value in the years to come.

The botanical determinations of seeds introduced have been made and the nomenclature determined by H. C. Skeels; and the descriptive and botanical notes have been arranged by G. P. Van Eseltine, who has had general supervision of this inventory. Miss Patty T. Newbold has assisted in the compilation of descriptive notes.

DAVID FAIRCHILD,
Agricultural Explorer in Charge.

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION,
Washington, D. C., January 4, 1923.

40258—23——2

INVENTORY.[1]

54426 to 54428.

From Canton, China. Seeds presented by F. A. McClure, Canton Christian College, through G. Weidman Groff. Received October 6, 1921.

54426. BENINCASA HISPIDA (Thunb.) Cogn. Cucurbitaceæ. Wax gourd. (*B. cerifera* Savi.)

Cheung tsit kwa.

For previous introduction, see S. P. I. No. 48553.

54427. CUCURBITA MOSCHATA Duch. Cucurbitaceæ. Squash.

Faan kwa.

54428. BENINCASA HISPIDA (Thunb.) Cogn. Cucurbitaceæ. Wax gourd.

Paak pei tung kwa.

54429 and 54430.

From Dehra Dun, India. Seeds presented by R. S. Hole, forest botanist, Forest Research Institute and College. Received October 8, 1921.

54429. DENDROCALAMUS BRANDISII Munro. Poaceæ. Bamboo.

A large, evergreen, tufted bamboo with ashy gray to greenish gray stems 60 to 120 feet high, 5 to 8 inches in diameter, slightly branched below, more so above, and having thick walls. This splendid bamboo is often confused with the somewhat similar *Dendrocalamus giganteus*, from which it is easily distinguished by the much smaller spikelets and thicker walled culms. It also closely resembles *D. flagellifer*. The stems are said to be used for building. (Adapted from *Annals of the Royal Botanic Garden, Calcutta, vol. 7, p. 90.*)

54430. MELOCANNA BACCIFERA (Roxb.) Kurz. Poaceæ. Bamboo. (*M. bambusoides* Trin.)

Muli or *Moorli*. The Terai bamboo. This is an evergreen arborescent bamboo, unarmed and beautifully erect without any bend or inequality of surface. It grows in its native habitat, the Chittagong Hills, to the height of 30 to 50 feet with a circumference of 12 to 13 inches at the base. Melocanna, though indigenous to Chittagong, is found all over eastern Bengal and Burma; it delights in a sandy soil, and dry spots suit it admirably.

The culms sprout from an underground ramifying rhizome at some distance from each other; and, though thin walled, the bamboo is strong and durable, being largely used for mats and building purposes. It is also observed that white ants and other insects so destructive to the dry bamboo seldom attack Melocanna. This bamboo also yields more or less *tabasheer*, locally called "choona" (lime), but its most remarkable feature is the large fleshy fruit it bears. This berry is in shape like an inverted pear, 3 to 5 inches long, with a long, curved, tapering point. There is a single oval seed inside the pericarp. The fruit is eaten by the natives. (Adapted from *Proceedings and Journal of the Agricultural and Horticultural Society of India, 1913, p. 62.*)

For previous introduction, see S. P. I. No. 21347.

[1] It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in these inventories are those which the material bore when received by the Office of Foreign Seed and Plant Introduction and, further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in these inventories will in many cases undoubtedly be changed by the specialists interested in the various groups of plants and the forms of the names brought into harmony with recognized American codes of nomenclature.

54431 and 54432. TRITICUM DURUM Desf. Poaceæ. **Durum wheat.**

From Bengazi, Barca, Libia, Africa. Seeds presented by the director of Economic and Financial Affairs, Servizi Agrari, Governo della Cirenaca. Received October 11, 1921.

54431. *Triminia.* 54432. *Tripshiro.*

54433. QUERCUS SERRATA Thunb. Fagaceæ. **Oak.**

From Rochester, N. Y. Nuts presented by John Dunbar, Assistant Superintendent of Parks. Received October 29, 1921.

"A half-evergreen oak, native to Japan and Chosen. We have grown it here for about twenty years, and it seems to be perfectly hardy. Two trees fruited quite freely this year; Doctor Sargent has no previous record of any trees having produced mature nuts in this country.

"Being of a half-evergreen nature the leaves remain green until very late in the season; sometimes they do assume a dull-yellow color. I think it is one of the most ornamental of the different species of oaks that have been introduced from Japan." (*Dunbar.*)

54434. CANARIUM OVATUM Engl. Balsameaceæ. **Pili nut.**

From Los Banos, Philippine Islands. Seeds presented by Prof. J. E. Higgins, College of Agriculture. Received October 20, 1921.

"Fresh selected *Pili* nuts. You are thoroughly familiar with the excellent quality of the *Pili* nut, and I need not emphasize its value. I believe that the tree ought to grow well in some of the moist places on the northern and eastern sides of Porto Rico and doubtless elsewhere under similar conditions in the West Indies." (*Higgins.*)

For previous introduction, see S. P. I. No. 47901.

54435 and 54436. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

From Sydney, New South Wales, Australia. Seeds presented by E. Breakwell, agrostologist, Botanic Gardens, through H. N. Vinall, United States Department of Agriculture. Received October 29, 1921.

"Two strains of sweet sorghum. These strains are very superior to those grown in the States, seed of which we obtained and grew side by side last season with those mentioned. The climatic conditions, of course, may be the reason for this, but I hope they will be successful with you." (*Breakwell.*)

54435. *Saccaline.* 54436. *No. 61.*

54437. CANNA FLACCIDA × IRIDIFLORA. Cannaceæ. **Canna.**

From Manila, Philippine Islands. Roots presented by P. J. Wester, agricultural adviser, Bureau of Agriculture. Received November 16, 1921.

"When I was stationed at Malabang, Mindanao, Philippine Islands, a friend gave me a lot of roots of a plant called locally 'Spanish flag.' The growth was jointed, the leaves similar to the Japanese iris, and the blossom, in cross section, approximately a figure 8. The color of the flower was the peculiar rich red of the flag of Spain, broadly bordered in standards and falls by a glorious and broad band of golden yellow, making the handsomest and most brilliant color combination I ever saw in a flower. The plant grows 6 or 7 feet high and blooms almost constantly." (*Col. J. A. Cole, U. S. Army, retired.*)

"The 'Spanish flag' of which Colonel Cole speaks is a variety of the cultivated canna which has naturalized itself and is common everywhere in the Philippines." (*Wester.*)

54438. CHAETOCHLOA ITALICA (L.) Scribn. Poaceæ. **Millet.**
(*Setaria italica* Beauv.)

From Tokyo, Japan. Seeds presented by The Tokyo Plant, Seed, & Implement Co. Received October 15, 1921.

For trial by the Office of Forage-Crop Investigations.

54439. ACACIA PYCNANTHA Benth. Mimosaceæ.

From Tangier, Morocco. Seeds presented by M. Jules Goffart. Received October 27, 1921.

"Concerning this Australian acacia, facts which I have just learned show that in certain regions it has much thicker bark than *Acacia mollissima*, and as for the richness in tannin, one may say it has about the same. Moreover, it has, in my opinion, a great advantage, in that it hybridizes more readily than *A. mollissima* when tried with its relatives *A. dealbata* and *A. normalis*. Furthermore, *A. pycnantha* has the advantage, here at least, over *A. mollissima* of tolerating more or less lime in the soil. On the other hand, at Kenitra, a thing which surprises me, although it is certain, is that it freezes more easily than *A. mollissima*. A few meters away both show the same resistance." (*Goffart.*)

For previous introduction, see S. P. I. No. 49485.

54440. ECHINOCHLOA CRUSGALLI EDULIS Hitchc. Poaceæ.
Barnyard millet.

From Nanking, China. Seeds presented by J. Lossing Buck, College of Agriculture and Forestry, University of Nanking. Received December 13, 1921.

For experimental use by the Office of Forage-Crop Investigations.

For previous introduction, see S. P. I. No. 51341.

54441 to 54444.

From Aleppo, Syria. Seeds presented by Constantine Kouchakji, through Dr. Gustavus Eisen, New York, N. Y. Received November 9, 1921. Quoted notes by Doctor Eisen.

54441. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

"*Derrak.* Peach from Baalbek, in Syria. Fruit green and red, 2¾ inches long, 2¼ inches wide. Matures in September."

54442 to 54444. PRUNUS ARMENIACA L. Amygdalaceæ. **Apricot.**

54442. "Apricot pits from Aleppo of the variety known as *Ajami* or *Ashami* (Persian). This is the largest apricot in Syria. The small fruit, 1¾ by 2 inches, was grown on poor soil. The largest fruit, 2 by 3¼ inches, was grown on very rich soil. The color is green with red blush. The skin is glossy, tough, and hard, making the fruit suitable for shipping. Flavor sweet like sugar, the sweetest of all apricots. I have never before seen such small pits."

54443. "A variety known in Aleppo as Baladi (from the city). Comes from Damascus. The kernel is sweet like a sweet almond. Color of skin yellow on one side, red on the other. Size 2 inches long by 1½ inches wide. This is the best quality of apricot in all northern Syria; grown in Aleppo, but the trees were imported from Damascus where the variety has been grown for generations. The skin is thick, but not hard. The form of the seed is quite swollen."

54441 to 54444—Continued.

54444. "Apricot pits from Baalbek. This variety is known as *Baalbek*. The fruit is about 2 inches each way, spherical, creased; the color is yellow, without red. The quality is very fine. The kernels are not sweet."

54445. Cucumis melo L. Cucurbitaceæ. **Muskmelon.**

From Tripoli, Libia, Africa. Seeds presented by Dr. E. O. Fenzi, Stabilimento Orticolo Libico. Received October 19, 1921.

"A first-class local variety of melon, known as *Popone di Zanzur* (Zanzur is an oasis on the coast about 10 miles west of Tripoli). The melon is oval-oblong in shape; skin yellowish green, very smooth, and very thin; pulp greenish white, exceedingly juicy, and delicately perfumed, with hardly any cavity, so that there is an unusual proportion of edible fruit. Should be taken up by some specialist, with the view of obtaining a more resistant skin without increasing its thickness." (*Fenzi.*)

54446. Tibouchina sp. Melastomaceæ.

From Rio de Janeiro, Brazil. Seeds presented by Dr. J. Simao da Costa. Received October 14, 1921.

"Seeds of *Tibouchina crenulata* trees which, when in full bloom, are among the most beautiful ornaments of the forests of these latitudes." (*Da Costa.*)

"Trees of the genus Tibouchina are common in the forests of tropical America. They are usually erect, slender, and not over 20 or 25 feet high. The leaves are large and attractive in appearance. The flowers, which are often 4 or 5 inches broad and are produced in clusters at the ends of the branchlets, are usually red-purple to purple in color, often changing from one to the other after opening." (*Wilson Popenoe.*)

Received as *T. crenulata*, for which a place of publication has not yet been found.

54447 and 54448.

From Sao Paulo, Brazil. Seeds purchased from Sr. Eduardo J. Toedtli, through Sr. José Augusto de Loyolla. Received November 12, 1921.

54447. Cymbopogon rufus (Nees) Rendle. Poaceæ. **Jaragua grass.** (*Andropogon rufus* Kunth.)

For previous introduction, see S. P. I. No. 49585.

54448. Melinis minutiflora Beauv. Poaceæ. **Molasses grass.**

"It is known everywhere in this country that the famous *capim gordura*, which is also called *capim gordura roxo Francano*, was native in this district of Franca, in the State of Sao Paulo, and has actually been cultivated by some farmers here in the north of the State, starting from Restinga up to Pedregulhos, along the Mogyana Railroad. This seed comes from a farm called 'Fazenda Santa Alcina,' which lies exactly between Restinga and Mandihu and belongs to Sr. João Alberto de Faria, who gathered the seed this year." (*Toedtli.*)

For previous introduction, see S. P. I. No. 47162.

54449. Bambos tulda Roxb. Poaceæ. **Bamboo.**

From Dehra Dun, India. Seeds presented by R. S. Hole, forest botanist, Forest Research Institute and College. Received October 29, 1921.

The common bamboo of Bengal. The wood is strong and the stems are used for roofing and scaffolding, for mats, etc. Native to Bengal and Burma. (Adapted from *Gamble, A Manual of Indian Timbers, p. 247.*)

For previous introduction, see S. P. I. No. 48229.

54450. Dendrocalamus sikkimensis Gamble. Poaceæ. Bamboo.

From Debra Dun, India. Seeds presented by R. S. Hole, forest botanist, Forest Research Institute and College. Received October 19, 1921.

A beautiful tufted bamboo with few culms, 60 feet or more high; it grows largest in Sikkim, where it has bigger culms than those of *Dendrocalamus hamiltonii* and is the one preferred for making the "chungas" for carrying water and milk and for churning butter. The dark-green culms are 5 to 7 inches in diameter, naked below, branched above. The oblong-lanceolate leaves, 6 to 10 inches long, are said to be poisonous. The species is readily distinguished by its large, red-brown, globose flower heads, densely velvety felted stem-sheath, and long ciliate auricles of the leaf sheath. Native to the northeast Himalayas in Sikkim and Bhutan at altitudes of 4,000 to 6,000 feet, and at Tura Peak, Garo Hills, at 3,500 feet. (Adapted from *Annals of the Royal Botanic Garden, Calcutta, vol. 7, p. 82.*)

54451 to 54453.

From Syria. Seeds presented by W. R. Meadows, through C. S. Scofield, United States Department of Agriculture. Received October 14, 1921. Quoted notes by Mr. Scofield.

54451. Calotropis procera Ait. Asclepiadaceæ.

"A plant in which Mr. Meadows is particularly interested. It is known, where he collected it, as artificial silk or vegetable silk. He found it growing at Haifa, Syria, on September 7, 1921. Mr. Meadows believes the fiber to have sufficient strength to be used as a filler yarn and hopes that the plant may be produced under observation at some point in the southwestern United States."

For previous introduction, see S. P. I. No. 51429.

54452 and 54453. Ceratonia siliqua L. Cæsalpiniaceæ. **Carob.**

For previous introduction, see S. P. I. No. 45924.

54452. "Honey carob selected at the Carmelite monastery near Haifa, on September 7, 1921. Said to contain a larger percentage of sugar than the ordinary carob."

54453. "Shade-tree carob from the Mount of Olives, just outside of Jerusalem, collected September 4, 1921."

54454 and 54455. Coix lacryma-jobi ma-yuen (Rom.) Stapf. Poaceæ. Ma-yuen.

From Manila, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Bureau of Agriculture, through Dr. C. V. Piper, United States Department of Agriculture. Received October 22, 1921.

Adlay. A form with soft hulls and very distinct from the ordinary *Coix lacryma-jobi* with hard, beadlike, shining grains. The soft-hulled, edible subspecies under discussion here does not appear to have been known to European writers until in the seventeenth century, though in India, its native habitat, this grain was of very ancient cultivation. Certain forms are roasted, then husked and eaten whole, being either parched (like corn) or boiled in the same manner as rice. Other forms are so very different that the grain may be milled and ground to flour and thereafter baked into bread. In China the grain is eaten in soup like pearl barley, which it very much resembles in appearance.

The Bukidnon forms are very vigorous and attain a height of 2 to more than 2.5 meters (8 feet) under favorable conditions. One plant will make from two to four straws, sometimes five. The roots are shallow and rarely extend beyond 35 to 40 centimeters (14 to 16 inches) from the plant. The yield of grain harvested in 1918 from a plat 5 by 6 meters (16 by 20 feet) in Bukidnon was 3,625 kilos to the hectare (3,236 pounds per acre), of which 72 per cent was hulled clean grain.

Analysis of adlay and various other cereals.

Samples.	Moisture.	Protein.	Fat.	Ash.	Crude fiber.	Carbohydrates, starch, etc., by difference.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Hulled adlay	10.91	11.27	6.65	1.89	0.45	68.83
Wheat	10.62	12.23	1.75	1.81	2.36	71.18
Corn	10.93	9.88	4.17	1.36	1.71	71.95
Rice	11.88	8.02	1.96	1.15	.93	76.0

The tender plants of adlay make a good forage for cattle and horses, and grown for this purpose several cuttings can be obtained from a sowing. (Adapted from *Philippine Agricultural Review, vol. 13, p. 217.*)

54454. "Grown in Laguna Province." (*Wester.*)

54455. "Grown in Jaro, Leyte Province." (*Wester.*)

For previous introduction, see S. P. I No. 49798.

54456. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Valence, France. Seeds purchased from Tezier Frères, through C. Carrigan, American consul, Lyons. Received November 4, 1921.

"Double-cut medium red clover from 2-year-old plants growing on one of the farms of Tezier Frères in the Department of Isere, Dauphine Alps. Harvested in August and September, 1920." (*Carrigan.*)

54457. DENDROCALAMUS sp. Poaceæ. **Bamboo.**

From Hankow, China. Seeds presented by Rev. Logan H. Roots, through P. S. Heintzlemann, American consul general. Received November 10, 1921.

"Bamboo seed from the district of Shihnanfu, in the west of Hupeh, where its appearance is connected by the Chinese with the calamities which have recently befallen them. It is said that it comes in hard times to relieve distress, as it acceptably takes the place of rice, and that after it comes the bamboo which produces it dies." (*Roots.*)

54458. TITHONIA DIVERSIFOLIA (Hemsl.) A. Gray. Asteraceæ.

From Buitenzorg, Java. Seeds presented by Dr. W. Docters van Leeuwen, director, Botanic Garden. Received November 15, 1921.

"A sunflowerlike plant, 5 to 6 feet high, widespread in Mexico and abundantly introduced into Java and Ceylon; it may be a good plant to use for silage." (*C. V. Piper.*)

54459. LAPAGERIA ROSEA Ruiz and Pav. Liliaceæ. **Chilean bellflower.**

From Santiago, Chile. Seeds presented by the Instituto Agricola Bunster, through Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received November 7, 1921.

"(No. 651a. Criadero 'El Verjel,' Angol, Chile. September 29, 1921.) *Copihue.* This, the national flower of Chile, has been grown occasionally in northern greenhouses, where it creates a genuine sensation when in bloom. It is a climbing plant of slow growth, with slender wiry stems and bright-crimson, tubular flowers about 3 inches in length. In southern Chile huge bunches of these blossoms are brought to the railway stations and sold to passing travelers. The plant requires an acid soil." (*Popenoe.*)

54460. ACTINIDIA CHINENSIS Planch. Dilleniaceæ. **Yang-tao.**

From Indio, Calif. Seeds presented by Bruce Drummond. Received December 2, 1921.

For previous introduction, see S. P. I No. 46864.

54461. TITHONIA DIVERSIFOLIA (Hemsl.) A. Gray. Asteraceæ.

From Peradeniya, Ceylon. Seeds presented by M. Kelway Bamber, secretary, Ceylon Agricultural Society. Received November 3, 1921.

"Seeds of *Tithonia diversifolia* (Singhalese: *Natha-Suriya*, wild sunflower). The plant grows wild." (*Bamber.*)

For previous introduction, see S. P. I. No. 54458.

54462 to 54464.

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, in charge, Department of Botany and Forestry, Experiment Station of the Hawaiian Sugar-Planters' Association. Received November 14, 1921.

54462. BAUHINIA VARIEGATA L. Cæsalpiniaceæ.

"A very handsome tree from India, Siam, Burma, China, and Java, of medium size and well adapted for street and ornamental planting. It has thick, somewhat heart-shaped leaves, and bears, in few-flowered corymbs, purplish red and yellow flowers about 2 inches long and half as broad. It is tropical in its requirements and suitable for cultivation in the United States in the southernmost part of Florida only." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 53568.

54463. CASSIA SIAMEA Lam. Cæsalpiniaceæ.

A medium-sized or sometimes a large tree, with gray, nearly smooth bark, papery, glabrous leaflets, and large, pyramidal, terminal panicles of small yellow flowers. The tree is probably native to Burma and is cultivated throughout India and many tropical countries for its hard heavy wood which is quite durable. The heartwood is dark brown to nearly black in stripes of dark and light; it is used for mallets, walking sticks, for building, and for fuel. (Adapted from *Rock, Leguminous Plants of Hawaii, p. 81.*)

For previous introduction, see S. P. I. No. 51813.

54464. ERYTHRINA VARIEGATA Stickm. Fabaceæ.

"Seeds from the University of Hawaii." (*Lyon.*)

54465 and 54466. GOSSYPIUM spp. Malvaceæ. **Cotton.**

From Ebolowa, Kamerun, Africa. Seeds presented by Fred Hope, superintendent, Frank James Industrial School. Received November 21, 1921.

"I took a trip some time ago and saw a lot of these plants and was surprised to learn that some of them were the size of young orange trees when commencing to bear. I should say the stalk was 4 inches in diameter. The branches in many cases had a spread of 10 feet. One tree was 8 years old, and the owner says he expects many more crops from the tree. Another that I saw, the largest, had a spread of 12 feet." (*Hope.*)

54465. Kidney cotton. **54466.** Wild cotton.

54467. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Salisbury, England. Seeds purchased from the Dunns Farm Seeds, Ltd., through Prof. R. G. Stapledon, Welsh Plant-Breeding Station, Aberystwith. Received December 9, 1921.

"*Dorset Marl-Grass Double-Cut red clover.* This is the most genuine strain and possesses the strongest vitality of any of the red clovers grown in this country." (*Dunns Farm Seeds.*)

54468. AGATI GRANDIFLORA (L.) Desv. Fabaceæ.
(*Sesbania grandiflora* Poir.)

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, in charge Department of Botany and Forestry, Experiment Station of the Hawaiian Sugar-Planters' Association. Received December 10, 1921.

"If given plenty of room, this plant grows into a tree some 30 feet tall, with a trunk diameter of 6 to 8 inches. Seedlings of this tree develop numerous large nodules on their roots at a very early stage in their growth, and we have used the species as a green soiling crop, the seeds being planted thickly and the plants turned under when they were 4 to 6 feet tall." (*Lyon.*)

For previous introduction, see S. P. I. No. 27580.

54469. EUCALYPTUS GUNNII Hook. f. Myrtaceæ.

From Hobart, Tasmania, Australia. Seeds presented by L. A. Evans, Acting Director of Agriculture. Received November 2, 1921.

The cider eucalypt is usually about 50 feet high and grows at altitudes of 4,000 to 5,000 feet in Australia. In the spring the Tasmanians make an excellent cider from the sweetish sap. The tree is also known as sugar gum, because of the sweetness of its leaves, which are browsed by stock. The bark yields tannin, which, in a 12-weeks' process, colors leather light brown and makes it rather flexible. The tree is usually crooked, but is used as a forest cover, and the wood is used for fuel and charcoal. It has stood 22° F. without the least injury. The species is well adapted to dry situations and has grown 7 feet a year on deep, sandy soil in Florida. (Adapted from *Eucalypts in Florida, U. S. Department of Agriculture, Forest Service Bulletin No. 87, pp. 19, 44,* and *Maiden, Useful Native Plants of Australia, pp. 126, 318, 465.*)

For previous introduction, see S. P. I. 36620.

54470. GARCINIA SPICATA (Wight and Arn.) Hook. f. Clusiaceæ.

From Yokohama, Japan. Seeds purchased from the Yokohama Nursery Co. Received November 10, 1921.

Introduced as a possible stock for the mangosteen.

A medium-sized tree native to the western peninsula of India, with obtuse, shining leaves up to 3 by 8 inches, small flowers in spikes, and smooth, deep-green fruits the size of a walnut. (Adapted from *Hooker, Flora of British India, vol. 1, p. 269.*)

For previous introduction, see S. P. I. No. 16787.

54471. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

From Poona, Bombay, India. Seeds presented by the director, Department of Agriculture, through Dr. C. R. Ball, United States Department of Agriculture. Received November 21, 1921.

"The heads were about 4 inches long, exceedingly compact and somewhat pyriform, while the seeds were similar in shape to those of *milo* or *feterita*, but smaller and of a yellowish white color." (*Ball.*)

54472. BAUHINIA FLAMMIFERA Ridley. Cæsalpiniaceæ.

From Singapore, Straits Settlements. Seeds collected by I. Henry Burkill, director, Botanic Garden. Received November 26, 1921.

A very lofty climber with scurfy red twigs and ovate-cordate leaves, usually notched at the tip, with red, pubescent petioles and veins. The red-stalked flowers are rich yellow on opening but soon turn to a bright red; they are borne on terminal panicles 8 inches long and nearly as thick. The petals are crisped and hairy outside. This is the common Bauhinia which forms such a conspicuous mass of color in the woods of the low country in Selangor and Perak. (Adapted from *Ridley, New and Rare Species of Malayan Plants, Journal of the Straits Branch, Royal Asiatic Society, No. 82, September, 1920, p. 182.*)

54473. CUCUMIS MELO L. Cucurbitaceæ. **Muskmelon.**

From Santiago, Chile. Seeds presented by Sr. Salvador Izquierdo, through Wilson Popenoe, Agricultural Explorer of the Department of Agriculture. Received November 10, 1921.

"*Escrito* melon. The melons of Chile, which ripen during the months of February, March, and April, are famous for their delicate flavor and remarkable keeping qualities. In 1920 a few of them were shipped from Valparaiso to New York, reaching the latter market in good condition. This seed, which has been obtained at the suggestion of Franklin Adams, of the Pan American Union, is of an unusually good variety, oblong in shape, and of large size. It should be tested in our Southwestern States." (*Popenoe.*)

54474. RIBES VULGARE Lam. Grossulariaceæ. **Garden currant.**

From Faringdon, England. Plants purchased from R. Tucker & Sons. Received December 3, 1921.

Introduced for experimental work by department specialists.

"A midseason variety of upright growth with grayish green foliage and long, medium-sized bunches of dark-red berries. A hardy and prolific variety which has been grown for many years." (*George Bunyard.*)

54475 to 54487. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

From Khartum, Anglo-Egyptian Sudan, Africa. Seed presented by G. E. Massey, botanist for the Department of Agriculture, Sudan Government, through H. N. Vinall, United States Department of Agriculture. Received December 5, 1921.

"This seed was selected by Mr. Massey as representative of the different varieties of the cultivated sorghums in the provinces or countries adjacent to Khartum." (*Vinall.*)

54475. *Abgara dura.*
54476. *Dura Safra.*
54477. *Faterita* (A).
54478. *Fateria* (B).
54479. *Faterita* (C).
54480. *Faterita* (D).
54481. *Faterita* (E).
54482. *Faterita* (F).
54483. *Faterita* (G).
54484. *Gahan* (?) *dura.*
54485. *Gassabi dura.*
54486. *Hamisi dura.*
54487. *Wad el Fahl.*

54488. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Melbourne, Australia. Seeds purchased from F. H. Brunning. Received December 5, 1921.

To be grown in comparison with American-grown seed; for use of department specialists.

"Locally grown medium red clover." (*Brunning.*)

54489. CARYOPHYLLUS MALACCENSIS (L.) Stokes. Myrtaceæ. **Ohia.**
(*Eugenia malaccensis* L.)

From Ancon, Canal Zone. Seeds presented by James Zetek. Received December 10, 1921.

A beautiful tree up to 60 feet high, native to the Malay Archipelago. The thick, glossy, dark-green leaves, 6 to 7 inches long, form a rich background for the showy clusters of flowers with their long, spreading, bright-red stamens. In early summer the shady interior of the tree seems to be filled with a delicate scarlet haze. The thin-skinned, white to crimson fruits, 2 to 3 inches

long, have crisp, white, juicy flesh. While the fruit is not especially esteemed, the tree is of distinct value as a tropical ornamental. (Adapted from *Popenoe, Manual of Tropical and Subtropical Fruits, p. 308.*)

54490 and 54491.

From Holguin, Cuba. Plants presented by Thomas R. Towns, citrus nurseryman and florist. Received December 30, 1921.

54490. ROSA ODORATA (Andrews) Sweet. Rosaceæ. **Rose.**

Rosa macho. This rose is recommended as a stock by Mr. Towns who states that it is a very strong growing rose which roots very easily. Although it is somewhat thorny he has found that *Paul Neyron*, a thornless variety, after 10 buddings on this stock shows very few thorns. The branches are 4 to 6 feet long and can be budded every 4 inches. In Cuba the plants are ready for budding three months after being set out; they bloom about two months after budding, and two months after this they are considered hardened and ready for sale.

The origin of the *macho* rose is unknown. However, Mr. Goucher, of this office, has also found a previous introduction of this species, S. P. I. No. 44426, to be extremely useful as a stock. The methods used are described under that number.

54491. PSIDIUM GUAJAVA L. Myrtaceæ. **Guava.**

"Seedlings of the everbearing guava." (*Towns.*)

54492. TRIFOLIUM PRATENSE L. Fabaceæ. Red clover.

From Milan, Italy. Seeds purchased from Stabilimento Agrario Botanico Fratelli Ingegnoli, through North Winship, American consul. Received December 23, 1921.

For experimental use by the Office of Forage-Crop Investigations.

"This clover is produced in the 'Comune of Cologno Monzese,' in the Province of Milan, Italy, in deep, flinty, clayey soil, slightly chalky." (*Winship.*)

54493. TRIFOLIUM PRATENSE L. Fabaceæ. Red clover.

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co., through Hon. A. M. Thackara, American consul general. Received December 29, 1921.

"The type of red clover known as '*Trèfle violet de Bretange*' from the 'Cotes du Nord' is a stronger grower and a better yielder than ordinary red clover." (*Thackara.*)

54494 to 54496. ECHINOCHLOA CRUSGALLI EDULIS Hitchc. Poaceæ. Barnyard millet.

From Yokohama, Japan. Seeds purchased from the Yokohama Nursery Co. Received December 22, 1921.

For the use of specialists of the United States Department of Agriculture.

54494. White.

54495. Brown.

54496. Korean.

54497 and 54498.

From Corfe Mullen, Wimborne, England. Plants purchased from J. J. Kettle. Received December 14, 1921.

54497. RUBUS sp. Rosaceæ. **Raspberry.**

Lloyd George. This variety is said to be perpetual in habit, to keep a supply of fruit from the earliest season until late autumn, and to be immensely vigorous and productive.

54497 and 54498—Continued.

54498. RUBUS sp. Rosaceæ. Raspberry.

Perfection (Marlboro). George Bunyard & Co. give a description and the history of this raspberry as follows: "Fruit large, red, of excellent flavor and vigorous growth; canes very stout, bright crimson. Raised by A. J. Caywood of Marlboro, N. Y.; introduced in 1884, and named by him *Marlboro*."

54499. DIOSCOREA JAPONICA Thunb. Dioscoreaceæ. Japanese yam.

From Hereford, England. Bulbils presented by Dr. H. E. Durham, "Dunelm." Received November 22, 1921.

"*Japanese round* yam. This yam seems so far as one can see from a single season's trial, to be the most promising variety I have yet tested. It grows more freely and regularly than the round *Upeh*. The rate of growth, both in a cool house, was about double that of the *Chappellier*." (*Durham.*)

54500. PISONIA ALBA Span. Nyctaginaceæ. Lettuce tree.

From Lamao, Bataan, Philippine Islands. Cuttings presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received November 16, 1921.

"The *lettuce tree* is fairly common in Manila, but I have never seen it flower and do not believe seeds are obtainable in the Philippines. As to the value of the tree for Florida, I am in doubt. The leaves are too thin and therefore likely to be easily injured by frost and would probably also be torn to shreds by the fall and winter winds, in which event the tree would be of little value as an ornamental, at least during the tourist season. The tree may do well in Porto Rico. I have tried the leaves boiled as turnip greens and they are remarkably good as a potherb, so good, in fact, that if on analysis they are found to have a fair amount of nutrients and vitamins the plant is certain to become widely grown in the Tropics. The leaves can not be eaten raw, however. I am using the common name *Maluko* for it. The tree is easily propagated, and once it gets a start can be broadcasted within a very short time." (*Wester.*)

54501. GOSSYPIUM sp. Malvaceæ. Cotton.

From Ceiba, Honduras. Seeds presented by Alexander K. Sloan, American consul. Received December 6, 1921.

Cotton seeds from the Aguan Valley near Trujillo.

"The natives make very little attempt to cultivate cotton, as the only use they put it to is as a binding for cuts in order to check the flow of blood. As a consequence the bush is undisturbed and grows in the course of six or seven years into a tree some 8 or 10 inches in diameter and from 25 to 30 feet in height. As the tree grows larger, the bolls become smaller and the yield in quantity and quality less. In those places where the native wants to obtain a larger crop than usual, the bush is cut to the ground each year and allowed to reseed itself. In that way the bolls are kept at their largest size." (*Sloan.*)

For previous introduction, see S. P. I. No. 28364.

54502. QUERCUS LANUGINOSA Thuill. Fagaceæ. Oak.

(*Q. pubescens* Willd.)

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received December 8, 1921.

A southern European oak which varies in size from a large shrub to a tree 40 feet in height. The grayish green leaves are deciduous and have very wavy margins. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 314.*)

This oak may prove to be a valuable ornamental for regions of mild winters.

54503. STRYCHNOS sp. Loganiaceæ.

From Elizabethville, Katanga, Belgian Congo. Seeds presented by Mrs. Mary Jacobs. Received December 9, 1921.

"From the forest near Elizabethville. This fruit is found in large quantities in this country." (*Mrs. Jacobs.*)

"The fruit is quite similar to that of *S. spinosa* in character, round, about 3 inches in diameter, with a thick, hard shell, inclosing gelatinous aromatic pulp in which numerous flattened seeds are embedded. Although the genus Strychnos is noted for the production of strychnine, a violent poison, the pulp of these fruits is edible. It is not, however, of much economic value." (*Wilson Popenoe.*)

54504. PHYSALIS ALKEKENGI L. Solanaceæ.

From Peking, China. Seeds presented by William Bembower. Received December 10, 1921.

"A red spherical solanaceous fruit I found being sold on the market here. It is said to furnish good medicine for colds." (*Bembower.*)

For previous introduction, see S. P. I. No. 28317.

54505. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

From Avondale, Auckland, New Zealand. Seeds presented by H. R. Wright. Received December 12, 1921.

For use of specialists in the department.

"I have seen some splendid crops of this variety." (*Wright.*)

"*Yates Market Favorite.* One of the earliest and hardiest varieties grown. A selection of the old large red, with large, slightly ribbed, solid, juicy fruits which are produced in great profusion and have a good flavor. This variety will thrive and perfect its fruit in dry or wet seasons, when all others are affected with black-spot and rot." (*Yates.*)

54506. EUCALYPTUS OBLIQUA L'Her. Myrtaceæ.

From Hobart, Tasmania, Australia. Seeds presented by L. A. Evans, acting Director of Agriculture. Received December 13, 1921.

A rapid-growing Tasmanian eucalypt 300 feet high, which grows on poor, stony ranges or on barren sandy soils if not subjected to prolonged drought. The tree is known as *stringy bark* and *Tasmanian oak* and is in much demand for railway sleepers, being nearly everlasting. The wood, being practically non-inflammable, makes a valuable safeguard against conflagrations in tunnels and is especially suitable for underground railways.

Stringy bark is especially suitable for harbor construction, being one of the densest timbers in the world and immune from the attacks of marine insects. It is one of the few kinds which can be obtained in great lengths and contains a resinous substance which resists the Xylophagas. There is an essential oil in the wood which prevents its rotting under exposure to moisture and at the same time acts as a preservative to iron. It stands great exposure to heat and damp, besides possessing the valuable property of repelling the white ant and teredo worm. This timber is of great value in building breakwaters, docks, etc., as its high specific gravity is such that it is unnecessary to weight the piles to get them into position when in deep water. (Adapted from *U. S. Department of Agriculture, Forest Service Bulletin 87, p. 44,* and from *Commerce Reports, 1910, p. 1052.*)

54507. RIBES NIGRUM × RECLINATUM. Grossulariaceæ.

From Wisley, Ripley, Surrey, England. Cuttings presented by Fred J. Chittenden, director, Royal Horticultural Society's Gardens. Received December 28, 1921.

The *Worcester berry.* A cross between *Whinham's Industry* gooseberry and *Boskoop Giant* black currant.

A bush 4½ feet high covering 30 to 36 square feet. It is extremely vigorous and makes shoots up to 5 feet long in a year. In general appearance the bush is a gooseberry and a very spiny one. It bears regularly and heavily, producing round fruits the size of a small gooseberry, arranged just as gooseberries are, purple-black in color, with a flavor like that of a sweet gooseberry and without a trace of the black currant. (Adapted from notes by *F. J. Chittenden* and *William Crump* in *The Garden, vol. 84, p. 607.*)

54508. GOSSYPIUM BARBADENSE L. Malvaceæ. **Cotton.**

From Cairo, Egypt. Seed presented by James A. Prescott, Sultanic Agricultural Society, Cairo, Egypt. Received December 27, 1921.

"*Zagora*, if true to type, is the earliest and most productive of the Egyptian types, running from 33 to 35 millimeters. It is very possible that it will succeed in parts of Texas where the longer staples and later Egyptians are not productive." (*George Freeman.*)

54509. LECYTHIS ZABUCAJO Aubl. Lecythidaceæ. **Paradise nut.**

From Port of Spain, Trinidad. Seeds presented by Eugene André. Received December 27, 1921.

"Nuts from 3 or 4 trees that bore fruits for the first time. Several fruited this year and are doing quite well at the Dabadie Nurseries, where few plants thrive in the poor, stiff clay. In all I have 33 trees of different sizes.

"The fruits are large, urn shaped, and vary in size, and they carry a considerable number of nuts." (*André.*)

54510 to 54514.

From Burringbar, New South Wales, Australia. Seeds presented by B. Harrison. Received December 22, 1921. Quoted notes by Mr. Harrison.

54510 and 54511. CUCUMIS MELO L. Cucurbitaceæ. **Muskmelon.**

54510. "*Kankri.* An East Indian fruit between the muskmelon and cucumber. The yellow fruit, 2 to 3 feet long, can be eaten with either sugar or salt, according to taste. It should be useful for pies and preserves."

54511. "*Mammoth Yellow.* Grows from 12 to 15 pounds in weight and is very prolific."

54512. PASSIFLORA EDULIS Sims. Passifloraceæ. **Granadilla.**

"*Mammoth passion fruit.* The fruits, of a very delicious flavor and very productive, are twice the size of the ordinary variety."

54513. PENNISETUM PURPUREUM Schumach. Poaceæ. Elephant grass.

"*Congo grass.* A variety of elephant grass, 10 to 12 feet high, with thicker stalks, larger leaves, and less fiber than other varieties. Yields 40 to 50 bushels of good fodder per acre and is permanent for some years when established. It grows well in dry soil and is very fattening."

54514. PHYSALIS PERUVIANA L. Solanaceæ. **Poha.**

"*Harrison's Giant.* Evolved by careful selection and cultivation. The very large berries, many 1½ inches in diameter, have a splendid flavor and make delicious pies and preserves. They are as easily grown as tomatoes."

54515. COELOCOCCUS AMICARUM (Wendl.) W. F. Wight. Phœnicaceæ. **Apple-nut palm.**

From Hilo, Hawaii. Seeds presented by Matthias Newell. Received November 10, 1921.

"The *apple-nut* or *ivory-nut* tree is 30 to 50 feet high and is found in the islands of the Pacific. The beautiful brownish scaly fruits are 3 inches in diameter and are used chiefly in the manufacture of the very large buttons used on ladies' coats. Much larger buttons can be made from this nut than from

that of the South American ivory nut, *Phytelephas macrocarpa*, and the buttons are more expensive also because there are fewer trees of *Coelococcus*." (*C. B. Doyle.*)

54516. AGATI TOMENTOSA (Hook. and Arn.) Nutt. Fabaceæ.
(*Sesbania tomentosa* Hook. and Arn.)

From Kaunakakai Molokai, Hawaii. Seed presented by James Munro, manager, Molokai Ranch. Received December 17, 1921.

A woody leguminous plant with pale glabrous compound leaves, silky pubescent beneath, and red or pale salmon-colored flowers an inch long. The plant is prostrate and forms dense mats on the white coral sands of Molokai and on the dunes at Moomomi; on Kauai it is a branching erect shrub several feet in height. (Adapted from *Rock, Leguminous Plants of Hawaii, p. 155.*)

54517 to 54519. CHAYOTA EDULIS Jacq. Cucurbitaceæ. **Chayote.**
(*Sechium edule* Swartz.)

From Vera Cruz, Mexico. Seeds presented by Paul H. Foster, American consul. Received October 3, 1921. Quoted notes by L. G. Hoover.

54517. "Fruits white, smooth, spineless, flattened oval to pyriform, about 9 ounces in weight, no corrugations; a desirable type, 4 inches long, 2½ inches wide, and 2 inches thick."

54518. "Fruits light green, smooth spineless surface, with five slight corrugations; shape flattened oval to pyriform; weight about 9 ounces; a desirable type."

54519. "Fruit attenuated pear shaped, color green; 6 inches long by 2 inches in diameter at greatest thickness; spiny; an undesirable type; weight 6 ounces."

54520. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* L. f.)

From Panama. Seeds presented by James Zetek. Received October 1, 1921.

"The lot seemed to be above the average for avocados, both in size and in quality. The fruit varied to some extent in form and substance, apparently including fruit of more than one tree. The seeds were not excessively large and completely filled the seed cavities." (*H. R. Fulton.*)

54521 to 54523.

From Panama. Collected by Dr. David Fairchild, Agricultural Explorer in Charge of the Office of Foreign Seed and Plant Introduction. Received October 4, 1921. Quoted notes by Doctor Fairchild.

54521. MELICOCCA BIJUGA L. Sapindaceæ. **Mamoncillo.**

"No. 3. A single seed collected September 17, 1921. From a tree of *mamoncillo* on the place of Samuel Lewis on the Sabana. Mr. Lewis's son sold this year $55 worth of fruit from this tree. The fruit of this seedling is one of the most delicious I tasted in Panama. There was only one fruit hanging on the tree. Apparently nothing has been done in the way of selecting this excellent fruit, which has an exquisite flavor but has the handicap of very fine silky fibers, which are attached to the seeds themselves and are rather annoying to one not accustomed to them. It is quite possible that this objectionable feature could be eliminated by selection."

For an illustration of this tree, see Plate I.

54522. ROSA sp. Rosaceæ. **Rose.**

"Cuttings of a rose collected in Panama."

54521 to 54523—Continued.

54523. MELICOCCA BIJUGA L. Sapindaceæ. **Mamoncillo.**

"No. 2. Seeds collected September 22, 1921. A tall fruit tree, very popular among the better classes of Panamans. These fruits came from the market of Panama and are not as fine as those from Samuel Lewis's large tree."

For previous introduction, see S. P. I. No. 54521.

54524. AESCULUS TURBINATA Blume. Æsculaceæ.

Japanese horse-chestnut.

From Rochester, N. Y. Seeds presented by John Dunbar, Assistant Superintendent of Parks, Rochester, N. Y. Received October 10, 1921.

"This is a rare tree in this country and in Europe." (*Dunbar.*)

A Japanese horse-chestnut up to 100 feet high with bright deep-green leaves sometimes 27 inches long, which turn clear golden yellow in the autumn. The erect, slender pyramidal panicles, nearly a foot long, are composed of creamy white flowers with petals center blotched with yellow turning pink with age. The tree is distinguished from the familiar European *Aesculus hippocastanum* by the smaller, warty, not spiny capsules 2 inches in length and width and by the finely and more evenly toothed edges of the leaflets. (Adapted from *Curtis's Botanical Magazine, pl. 8713.*)

54525. DATURA LEICHHARDTII F. Muell. Solanaceæ.

From Brisbane, Queensland, Australia. Seeds presented by C. T. White, Government botanist. Received October 7, 1921.

A tall coarse annual, 1 to 3 feet high, with ovate leaves 3 to 4 inches long and pale yellowish white flowers 2 inches long. The reflexed, globular capsule, an inch in diameter, is very prickly. Native to North Australia and Queensland. (Adapted from *Bentham, Flora Australiensis, vol. 4, p. 468.*)

54526. MANGIFERA INDICA L. Anacardiaceæ. **Mango.**

From Port of Spain, Trinidad, British West Indies. Plants presented by R. O. Williams, curator, St. Clair Experiment Station. Received October 10, 1921.

"*Père Louis* is a dwarf-growing variety, fruiting early. The plant from which the budwood was taken is a round-headed dwarf tree, furnished with branches to the ground. I remember receiving the *Père Louis* in Demerara, from St. Lucia, and this had much the same habit. I think that the dwarf, early-fruiting habit is inherent. I do not think that the stocks used have anything to do with it, because they are taken indiscriminately and when sufficiently large are grafted upon." (*J. F. Waby, acting curator.*)

"The *Louis* bears very young, has no fiber nor any sourness at the core, and the flavor is nearly as good as that of the *Julie*, which is the best for flavor I have ever eaten. (*O. W. Barrett.*)

54527 and 54528.

From Panama. Seeds collected by Dr. David Fairchild, Agricultural Explorer in Charge of the Office of Foreign Seed and Plant Introduction. Received October 4, 1921. Quoted notes by Doctor Fairchild.

54527. ANNONA MURICATA L. Annonaceæ. **Soursop.**

"Seeds procured September 17, 1921, from an unusually large, presumably fine-flavored fruit of the guanabana, *Annona muricata*. I am not sufficiently familiar with the varieties of this fruit to say whether this was really superior to others which may have been already introduced. The fruit was at least 15 inches long and about 8 inches in diameter, and the flavor could not be very well estimated, because the fruit was picked while green, but Samuel Lewis, who gave me the fruit, assured me it was one of the best varieties he had seen."

54527 and 54528—Continued.

54528. ANNONA PURPUREA Moc. and Sesse. Annonaceæ. **Soncoya.**

"Procured September 18, 1921, from a tree growing beside the path leading to the cove from the Hotel Aspinwall, Taboga.

"The fruit is apparently little appreciated by the people, for it is left to rot on the ground. Some of them were 5 or 6 inches in diameter and very attractive looking, but the flesh was so fibrous and it had so little character that I doubt whether it would be worth growing for its own sake. The gorgeous orange-yellow color of the fruit flesh, however, may make it of value as a species for breeding purposes."

54529. CARICA sp. Papayaceæ.

From Rio Pescado, Panama. Seeds collected by Graham Fairchild. Received October 4, 1921.

"At first glance this fruit resembles the ordinary wild papaya, *Carica papaya*, but on examination it proves to be an entirely different thing. It is rather typically papaya shaped, with more pronounced grooves, not as deep, however, as those of the mountain papaw, *Carica candamarcensis*, of a golden yellow color, very attractive, and has a faint and very pleasant aroma. The fruits are of a peculiarly uniform size and shape. The interior is filled with a white frothy arillus around the seed; this arillus is acidulous in character but without very much flavor. The flesh of the fruit is thin and has little flavor; the fruit as it stands is comparatively worthless. The leaves, instead of being laciniate, are almost entire. The texture of the leaves seems to be harsher than that of the papaya. The tree grows to be about 20 inches high, I should judge. From the low lands near the river." (*David Fairchild.*)

Fruits of this papaya are shown in Plate II.

54530 to 54536.

From Panama. Seeds collected by Dr. David Fairchild, Agricultural Explorer in Charge of the Office of Foreign Seed and Plant Introduction. Received October 4, 1921. Quoted notes by Doctor Fairchild.

54530. CARYOPHYLLUS MALACCENSIS (L.) Stokes. Myrtaceæ. **Ohia.** (*Eugenia malaccensis* L.)

"Seeds from beneath trees cultivated by the late Enrique Lewis at his place on the Sabana, Panama. Gathered September 17, 1921.

"The fruit is much esteemed by members of Mr. Lewis's family and by others, and I had the pleasure of tasting preserves made from it which seem to have a characteristic flavor of some merit. When in flower, the branches of this tree are gorgeous, covered as they are with masses of large flowers an inch or so across, composed of hundreds of beautiful deep rose-pink or crimson stamens. The tree itself is a beautiful ornamental, and it would seem as though more work in the selection of this species should be attempted. The remarkable structure of the seeds suggests a high degree of polyembryony. When the seed germinates (as many of them were doing under the tree) the whole, large, brilliant-green seed seemed to break up into fragments."

For previous introduction, see S. P. I. No. 26412.

54531. CAPSICUM ANNUUM L. Solanaceæ. **Pepper.**

"Seeds of a brilliant-yellow pepper grown in Panama. Collected September 15, 1921. This specimen was collected on the Chillibrillo River at a native Panaman hut. The owner of the plant described it as being 'hot as a candle.' In reality it is a rather mild, almost sweet pepper."

54532. SPONDIAS MOMBIN L. Anacardiaceæ. **Yellow mombin.**

"Seeds of the *jobo* or *yellow mombin*, presented by Mr. Zetek, of Panama, September 19, 1921.

"Few fruit trees which I have ever seen are more heavily laden with fruits than this *jobo*. It is a favorite fruit of the children of Panama, and everywhere at this season of the year you find children throwing sticks at the trees to knock down the *jobos*. The fruits vary tremendously in flavor and amount of fruit flesh, also in the texture of the skin



THE MAMONCILLO, A NEGLECTED FRUIT TREE OF TROPICAL AMERICA. (MELICOCCA BIJUGA L., S. P. I. No. 54521.)

Not the least important phase of plant introduction is the propagation by vegetative means of superior forms of species such as the mamoncillo, which, as usually seen on tropical American seacoasts, is not a fruit of great value, but which occurs now and then in superior seedling forms. From the tree here shown $55 worth of fruit was sold in one season. Good mamoncillos are the size of plums; they have a thick leathery skin within which is yellowish-white, translucent pulp of aromatic flavor and a single large seed to which the pulp clings tenaciously. (Photographed by David Fairchild, Panama, Canal Zone, September 15, 1921; P27619FS.)



A RELATIVE OF THE PAPAYA. (CARICA SP., S. P. I. No. 54529.)

Throughout tropical America are found many wild species of Carica, whose edible fruits are usually similar to the cultivated papaya in general character, though oftentimes of very different flavor. The desirability of crossing some of these wild forms with the cultivated sorts has many times been suggested, but so far as known has not yet been seriously attempted. The species here shown, which occurs in the Canal Zone, yields small golden-yellow pleasantly flavored fruits. (Photographed by David Fairchild, Rio Pescado, Canal Zone, September 9, 1921: P27607FS.)



A NEGLECTED FRUIT OF TROPICAL AMERICA. (SPONDIAS MOMBIN L., S. P. I. No. 54532.)

The despised hog plum, or yellow mombin, abundant in many tropical American countries, is sometimes found in superior seedling varieties which merit propagation. Ordinarily it has a strongly terebinthine taste which makes it unattractive to most palates, but occasional forms are sweet, pleasant, and even delicious. Since nearly all species of Spondias are easily propagated in the Tropics by means of large cuttings, it should be a simple matter to improve the yellow mombin by selection and make it a valuable fruit. (Photographed by David Fairchild, Ancon, Canal Zone, September 15, 1921; P27616FS.)



THE CAPUCHIN ORANGE OF CHILE. (CITRUS SINENSIS (L.) OSBECK, S. P. I. No. 54651.)

This orange, presumably a horticultural variety of the common sweet orange, differs from the latter in its dwarf habit of growth and the small size of its fruits, which are rarely over 2 inches in diameter. Since the flavor and quality of the fruit are excellent, the variety suggests itself as of interest for cultivation in California and Florida, where it may prove useful as an attractive dooryard tree. (Photographed by Wilson Popenoe, Santiago de Chile, October 6, 1921; P18886FS.)

54530 to 54536—Continued.

and the size of the seed. Evidently nothing has been done in the way of selection, and yet the tree is perfectly adapted to conditions on the Zone. It seems to me that the best seedlings should be found and preserved by budding. Ice creams and 'chichas' are also made from the fruit flesh."

For previous introduction, see S. P. I. No. 45086.

For an illustration of the fruits of this tree, see Plate III.

54533. SPONDIAS MOMBIN L. Anacardiaceæ. **Yellow mombin.**

"Five fruits of a particularly fine-flavored seedling growing back of the Aspinwall Hotel, at Taboga. Collected September 18, 1921."

For previous introduction, see S. P. I. No. 54532.

54534. SPONDIAS sp. Anacardiaceæ.

"Nine seeds of a variety which I did not see. Collected September 18, 1921. I found the seeds on the path leading along the river from the center of the town over into the center of the island of Taboga. These may represent a better strain of the *jobo* than any of the other seeds."

54535. STERCULIA sp. Sterculiaceæ.

"Seeds of a species of Sterculia, sent me by Hugh White, from a handsome shade tree near the corner of his house at Balboa. Collected September 15, 1921. I think this is one of the handsomest shade trees used on the avenues of Balboa, stately and with rather majestic branching habit and, according to Mr. White, bearing good edible seeds of which the children are very fond. The quality of the seeds seems to me rather indifferent. I was unable to find out what species of Sterculia this is, although I suspect it may be *Sterculia foetida*, and if it is, the stench of its flowers should be taken into account seriously by anyone planting it for shade. *S. foetida* has one of the foulest odors known in plants."

54536. ARISTOLOCHIA sp. Aristolochiaceæ.

"Two basketlike fruits of a vine found on the road along the little stream leading from the center of the town back into the island of Taboga. Collected September 18, 1921. The fruits themselves are a distinct curiosity; the vine is not particularly attractive."

54537 to 54539. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

From Buitenzorg, Java. Seeds presented by A. A. Crince le Roy, chief, Plant-Breeding Station. Received October 3, 1921. Quoted notes by H. N. Vinall, agronomist, United States Department of Agriculture.

54537. "*Black* sorghum. Seed resembles that of ordinary Black Amber sorgo."

54538. "*Klakah* sorghum. Probably a sweet sorghum, but the seed is unlike that of any of our common varieties."

54539. "*Brown* sorghum. Seed resembles very closely that of Red Amber sorgo."

54540 to 54544.

From Landskrona, Sweden. Seeds presented by W. Weibull. Received October 3, 1921.

Introduced for testing by the Office of Cereal Investigations.

54540 and 54541. AVENA SATIVA L. Poaceæ. **Oats.**

54540. *Echo* oats. **54541.** *Fortune* oats.

54542. SECALE CEREALE L. Poaceæ. **Rye.**

Storm winter rye.

54540 to 54544—Continued.

54543 and 54544. TRITICUM AESTIVUM L. Poaceæ. Common wheat. (*T. vulgare* Vill.)

54543. *Iduna* winter wheat.

54544. *Standard* winter wheat.

54545 and 54546. SACCHARUM OFFICINARUM L. Poaceæ. Sugar cane.

From Saigon, Cochin China. Cuttings presented by M. E. Carle, director, Laboratoire de Genetique, Institut Scientifique de L'Indochine. Received October 6, 1921. Notes adapted from *Bulletin Agricole de L'Institut Scientifique de Saigon, vol. 2, p. 278.*

54545. *2714 POJ.* A cross between *2364 POJ* (*100 POJ*, very sweet, × *Kassoer*, sereh resistant[2]) and *EK 28*. An early cane similar to *100 POJ*, but thicker, with long, straight internodes, very large, long green leaves at first erect, becoming bent, and a thick inflorescence. This cane suckers freely and has strong, rapid growth. The juice is 15.8 to 20.3 per cent saccharose.

54546. *2725 POJ.* A cross between *2364 POJ* (*100 POJ*, very sweet, × *Kassoer*, sereh resistant[2]) and *EK 28*. An early cane similar to *100 POJ*, but thicker, with very large, bluish green, bent leaves, and thick inflorescence. The cane suckers freely and is of strong, rapid growth. The juice is 19.5 to 21.9 per cent saccharose.

54547 and 54548. OLEA EUROPAEA L. Oleaceæ. Olive.

From Haifa, Syria. Bud sticks presented by Amram Khazanoff, Department of Experimental Agriculture. Received October 8, 1921. Quoted notes by Mr. Khazanoff.

"Material from the oldest and at the same time thriftiest looking olive trees on the Mount of Olives. These happened to be on the premises of the Greek monastery close to the Garden of Get-Shemane (Gethsemane) and appeared to be several centuries old."

54547. "Wild variety on which the cultivated variety was budded."

54548. "Cultivated variety from old trees."

54549. KOPSIA ARBOREA Blume. Apocynaceæ.

From Littleriver, Fla. Seeds presented by Charles T. Simpson. Received October 10, 1921.

"A beautiful, large shrub or small tree native to Japan. It has opposite or whorled, thick, glossy, oblong leaves and corymbs of pretty white flowers which are followed by large, brilliant-crimson, almond-shaped fruits. It is a very fine ornamental, and its only apparent drawback is that it is rather tender. It should be grown in a protected place in lower Florida." (*Simpson.*)

For previous introduction, see S. P. I. No. 39543.

54550. THESPESIA LAMPAS (Cav.) Dalz. and Gibs. Malvaceæ.

From Chota Nagpur Circle, Bengal, India. Seeds presented by A. P. Cliff, Director of Agriculture, through Dr. C. V. Piper. Received October 11, 1921.

"*Ban Kapas* (wild cotton)." (*Cliff.*)

A treelike herbaceous plant with palmately lobed, pilose leaves, 5 inches across and tomentose beneath. The yellow, bell-shaped flowers are 2½ inches wide, with a crimson center. (Adapted from *Kirtikar, Indian Medicinal Plants, vol. 1, p. 188.*)

For previous introduction, see S. P. I. No. 52386.

[2] Sereh is a serious disease of sugar cane in Java. Its cause is not yet definitely known.

54551 and 54552.

From Horqueta, Paraguay. Seeds presented by Thomas R. Gwynn, through Harry Campbell, American consul, Asuncion, Paraguay. Received November 14, 1921.

54551. CHORISIA SPECIOSA St. Hil. Bombacaceæ.

"A regular, beautifully formed tree 20 feet high, abundant in Argentina as far north as Formosa and in the river provinces of Paraguay. The boll is 4½ inches in diameter and 6 inches long. The yellow fiber, called Samahu or Samuy, and similar to the best Javan kapok, is used to a limited extent for stuffing pillows and can be used commercially for life preservers, jackets, water wings, mattresses, etc. The tree has resisted 3° C. without injury to its flowers, although the bolls require hot sun. It is one of the most promising plants for cultivation in the warmer parts of the United States and is probably hardier than kapok." (*L. H. Dewey.*)

54552. CYPHOMANDRA sp. Solanaceæ.

"*Aguaraya* (fox fruit). A bush very like the eggplant, except that all the stems and underside of the leaves are covered with short stout thorns. The fruit is the shape and size of a big Stone tomato, light green, thin skinned, and the seed bunched in the center; the meat is abundant, cream colored, and tastes like a Brazilian *mango de oro*. The plant is very sensitive to frost." (*Gwynn.*)

For previous introduction, see S. P. I. No. 39336.

54553. PENNISETUM ORIENTALE TRIFLORUM (Nees) Stapf. Poaceæ. Himalaya grass.

From Kingston, Jamaica. Seeds presented by W. S. Goodman, acting superintendent, Hope Gardens. Received November 10, 1921.

"Called *Himalaya grass* in the West Indies and reputed to be a good forage. Typical *Pennisetum orientale* is regarded as a good fodder grass in Baluchistan." (*C. V. Piper.*)

54554 and 54555. AMERIMNON LATIFOLIUM (Roxb.) Kuntze. (*Dalbergia latifolia* Roxb.) [Fabaceæ. Shisham.

From British India. Seeds presented by C. P. Hartley. Received November 25, 1921. Quoted notes by Mr. Hartley.

"Seeds of a tree that may possibly be of economic value in the southern United States. In Java the tree grows rapidly, outgrowing and suppressing teak on some of the poor soils of eastern Java. The wood is heavier and stronger than teak and is used for furniture, tool handles, and other exacting work, most of the carving in the market here being done on Dalbergia (*sono kling*). The heart is beautiful purple-brown on a fresh cut, changing to nearly black-brown after exposure to the air. The chief limitation on its usefulness is its hardness. From the silvicultural standpoint its remarkable root-sprouting capacity is of interest. In Java it practically never produces seed, reproduction being easily obtained on cut-over areas by wounding the roots of the old trees. I imported this seed from British India in the hope of getting a strain resistant to the local canker disease that affects the quality of the timber here. There is some reason to suspect that, with teak, this tree may have been introduced from British India in the days of the Hindu kingdoms here."

54554. "From Belgaum, Bombay Presidency."

54555. "From Chikalda, Melghat Forest Division, Central Provinces."

54556 to 54560.

From Malanzhe, Angola, Africa. Seeds collected by John Gossweiler and presented by H. A. Longworth, agricultural missionary, Methodist Episcopal Church. Received November 25, 1921.

54556 to 54560—Continued.

54556. CHLORIS MYRIOSTACHYA Hochst. Poaceæ. **Finger grass.**

A perennial grass 1 to 2 feet high ascending from a procumbent base, with flat or convolute leaves. Native to the Dekkan Peninsula. (Adapted from *Hooker, Flora of British India, vol. 7, p. 292.*)

54557. CYMBOPOGON RUFUS (Nees) Rendle. Poaceæ. **Jaragua grass.**
(*Andropogon rufus* Kunth.)

A tufted perennial up to 8 feet high, very generally distributed throughout tropical Africa. It is commonly used for grass fencing in Nigeria and for thatching in Angola. The erect or ascending stems are often stout and bear narrow, rigid, erect leaves and slender, lax panicles 1 to 2 feet long. (Adapted from *Stapf, Flora of Tropical Africa, vol. 9, p. 304,* as *Hyparrhenia rufa.*)

54558. ERAGROSTIS sp. Poaceæ. **Grass.**

"Native forage grass." (*Longworth.*)

54559. TRICHOLAENA sp. Poaceæ. **Grass.**

"Native forage grass." (*Longworth.*)

54560. VETIVERIA NIGRITANA (Benth.) Stapf. Poaceæ. **Grass.**

A coarse smooth perennial with stout rhizomes, stems up to 6 feet high, with oblong panicles up to 1 foot long. The linear, erect, rigid leaves are pale green and 1 to 3 feet long. Native to tropical Africa. (Adapted from *Stapf, Flora of Tropical Africa, vol. 9, p. 157.*)

54561 to 54620. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

From China. Seeds presented by B. W. Skvortzow, Harbin, Manchuria. Received November 16, 1921.

54561. No. 1. Green soy bean for oil, from southern Manchuria.

54562. No. 2. Yellow soy bean from Kaiyuan, Shengking Province.

54563. No. 3. Yellow soy bean from Jungchiangko, Shengking Province.

54564. No. 4. Brown soy bean from Jungchiangko, Shengking Province.

54565. No. 5. Yellow soy bean from Changchun, Kirin Province.

54566. No. 6. Yellow soy bean from Tiehling, Shengking Province.

54567. No. 7. Black soy bean from Tiehling, Shengking Province.

54568. No. 8. Green soy bean from Changchun, Kirin Province.

54569. No. 9. Black soy bean from Kungchuling, Shengking Province.

54570. No. 10. Yellow soy bean from Chutzecheng, southern Manchuria.

54571. No. 11. Yellow soy bean from Shwangchengfu, Kirin Province.

54572. No. 12. Yellow soy bean from Kungchuling, Shengking Province.

54573. No. 13. Black soy bean from Kaiyuan, Shengking Province.

54574. No. 14. Yellow soy bean from Tiehling, Shengking Province.

54575. No. 15. Yellow soy bean from Tungtzedeng, southern Manchuria.

54576. No. 16. Yellow soy bean from Taomen, southern Manchuria.

54577. No. 17. Yellow soy bean from Suntzetai, near Kaiyuan, southern Manchuria.

54578. No. 18. Black soy bean from Changchun, Kirin Province.

54579. No. 19. Yellow soy bean from Changchun, Kirin Province.

54580. No. 20. Green soy bean from Tiehling, Shengking Province.

54561 to 54620—Continued.

54581. No. 21. Green soy bean from Changchun, Kirin Province.
54582. No. 22. Green soy bean from Changchun, Kirin Province.
54583. No. 23. Green soy bean from Kaiyuan, Shengking Province.
54584. No. 24. Yellow soy bean from southern Manchuria.
54585. No. 25. Green soy bean from Liaoyang, Shengking Province.
54586. No. 26. Green soy bean from Liaoyang, Shengking Province.
54587. No. 27. Yellow soy bean from Liaoyang, Shengking Province.
54588. No. 28. Black soy bean from Liaoyang, Shengking Province.
54589. No. 29. Yellow soy bean from Beitzeyangcheng, southern Manchuria.
54590. No. 30. Green soy bean from Yutzecheng, southern Manchuria.
54591. No. 31. Small green soy bean from Yungchiangkou, southern Manchuria.
54592. No. 32. Yellow soy bean from Chonko, southern Manchuria.
54593. No. 33. Green soy bean from Liaoyang, Shengking Province.
54594. No. 34. Black soy bean from Liaoyang, Shengking Province.
54595. No. 35. Yellow soy bean from northern Manchuria.
54596. No. 36. Yellow soy bean from Changchun, Kirin Province.
54597. No. 37. Yellow soy bean from Tungtzedeng, southern Manchuria.
54598. No. 38. Black soy bean from Changchun, Kirin Province.
54599. No. 39. Black soy bean from Liaoyang, Shengking Province.
54600. No. 40. Yellow soy bean from Liaoyang, Shengking Province.
54601. No. 41. Yellow soy bean from northern Manchuria.
54602. No. 42. Black soy bean from Liaoyang, Shengking Province.
54603. No. 43. Yellow soy bean from Tungkalun, Kirin Province.
54604. No. 44. Green soy bean from Shungyanghe, southern Manchuria.
54605. No. 45. Black soy bean from Nungansieng, southern Manchuria.
54606. No. 46. Yellow soy bean from Penhsiku, southern Manchuria.
54607. No. 47. Yellow soy bean from Shengshaton, southern Manchuria.
54608. No. 48. Yellow soy bean from Shachoutai, southern Manchuria.
54609. No. 49. Yellow soy bean from Chanchuen, Kwangtung Province.
54610. No. 50. Brown soy bean from Changchun, Kirin Province.
54611. No. 51. Yellow soy bean from Anda railway station, northern Manchuria.
54612. No. 52. Yellow soy bean from Tiehling, Shengking Province.
54613. No. 53. Yellow soy bean from Tiehling, Shengking Province.
54614. No. 54. Yellow soy bean from Changchun, Kirin Province.
54615. No. 55. Yellow soy bean from Harbin, Kirin Province.
54616. No. 56. Yellow soy bean from Kungchuling, Shengking Province.
54617. No. 57. Yellow bean from Fangtzetung, southern Manchuria.
54618. No. 58. Yellow soy bean from Ssupingkai, southern Manchuria.
54619. No. 59. Yellow soy bean from Kaiyuan, Shengking Province.
54620. No. 60. Yellow soy bean from Changchun, Kirin Province.

54621. LAPAGERIA ROSEA Ruiz and Pav. Liliaceæ.
Chilean bellflower.

From Santiago, Chile. Plants presented by the Instituto Agricola Bunster, through Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received November 7, 1921.

"(No. 651. Criadero 'El Verjel,' Angol, Chile. September 29, 1921.)" (*Popenoe.*)

For previous introduction, see S. P. I. No. 54459.

54622 to 54643.

From Santiago, Chile. Plants presented by Sr. Salvador Izquierdo, through Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received November 7, 1921. Quoted notes by Mr. Popenoe.

54622 to 54625. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

54622. "(No. 662. Santa Ines, Chile. October 7, 1921.) *Sport No. 1.* A variety originated at Sr. Izquierdo's nursery, Santa Ines. It is described as a large white cling, round in form, and of very sweet and pleasant flavor. It ripens in February and is considered excellent both for table use and for preserving."

54623. "(No. 663. Santa Ines, Chile. October 7, 1921.) *Sport No. 2.* A variety originated very recently at Sr. Izquierdo's nursery, Santa Ines, and not yet named. It is a cling, of somewhat elliptical form with a sharp point at the apex, white fleshed, and weighing up to 450 grams. It ripens in February and is considered to be a promising new sort."

54624. "(No. 664. Santa Ines, Chile. October 7, 1921.) *Transparente de Conserras* peach. From Sr. Izquierdo's nursery, Santa Ines. This is a standard preserving variety, recommended as one of the very best. It is described as the earliest white peach grown in central Chile; its fruit has much aroma and is of delicate texture and very rich flavor. The tree is said to be more robust and resistant to disease than most other varieties."

54625. "(No. 665. Santa Ines, Chile. October 7, 1921.) *Almendruco* peach. From Sr. Izquierdo's nursery, Santa Ines. This is a remarkable small-fruited peach, believed to have originated in the Elqui Valley of northern Chile, where it is grown commercially. It produces two crops; the fruits of the first one are of medium size and fair quality; those of the second are smaller, very sweet, with almost no seeds in them. These small fruits are used for drying whole and are also preserved in sirup. The variety is a clingstone and is recommended by Prof. John W. Gilmore for trial in California."

54626. AMYGDALUS PERSICA NECTARINA Ait. **Amygdalaceæ. Nectarine.**

"(No. 666. Santa Ines, Chile. October 7, 1921.) *Cardinal Mora.* A nectarine said to have originated as a chance seedling in Sr. Izquierdo's nursery at Santa Ines. It is described as the best nectarine grown in Chile, because of its large size, aromatic flavor, and richly colored juice. It ripens toward the end of January and is recommended for commercial planting."

54627. BELLOTA MIERSII Remy. Lauraceæ. **Belloto.**

"(No. 673. Santa Ines, Chile. October 6, 1921.) Sr. Izquierdo describes this species as follows: 'A large Chilean tree whose wood is highly appreciated for the manufacture of household utensils because of the great diameter which the trunk attains. It has attractive foliage and fruits, the latter when ripe being useful for feeding hogs. A good tree for parks, because of the excellent shade which it gives.' For trial in the Southwestern States and on the Pacific coast."

54622 to 54643—Continued.

54628. CRINODENDRON PATAGUA Molina. Elæocarpaceæ. **Patagua.**
(*Tricuspidaria dependens* Ruiz and Pav.)

"(No. 672. Santa Ines, Chile. October 6, 1921.) *Patagua.* A Chilean tree which grows well in swampy regions. It has small, bell-shaped, white, fragrant flowers, giving it value as an ornamental. The wood is used for cabinetmaking and the bark for tanning. Introduced at the request of Dr. F. V. Coville, of the United States Department of Agriculture."

54629. CRYPTOCARYA RUBRA (Molina) Skeels. Lauraceæ. **Peumo.**
(*C. peumus* Nees.)

"(No. 667. Santa Ines, Chile. October 6, 1921.) One of the handsomest of the native Chilean ornamental trees of rather small size, erect in habit, and in character of foliage somewhat suggests the live oak of southern California. In autumn it bears a profusion of red fruits the size of olives, which greatly add to its decorative value. The fruits have a thin layer of pulp surrounding a large seed and are eaten when cooked. They are not, however, of much value. The species is one which should be tried in our Southwestern States."

54630 and 54631. FRAGARIA CHILOENSIS (L.) Duchesne. Rosaceæ.
Chilean strawberry.

54630. "(No 653. Santa Ines, Chile. October 6, 1921.) *Frutilla roja,* or red-fruited Chilean strawberry. This is a selected strain of the common Chilean strawberry, said to produce fruits of large size and good quality. It will be of interest to strawberry breeders in the United States, and in addition it is worthy of trial in our Southwestern States. While the fruit of *Fragaria chiloensis* is inferior in quality to that of our best cultivated strawberries, it is remarkable for its excellent shipping and keeping qualities; and it seems that varieties might be produced by selection which would merit cultivation on a commercial scale.

"The berry is much used for canning and preserving. It is also eaten fresh. It is a curious circumstance that this species of strawberry, whose fruits are commonly an inch to an inch and a half long, should be called in Chile, Peru, and Ecuador *frutilla* (little fruit), while the much smaller fruit of *Fragaria vesca,* rarely over half an inch long, is termed *fresa* or strawberry. This last-named species is cultivated commercially at Quillota, Chile, whence the fruit, which ripens earlier than that of *F. chiloensis,* is sent to the markets of Santiago.

"As far as I can ascertain by careful examination of the plants and fruits, the *frutillas* of Chile, Peru, and Ecuador are of the same species. Neither in Peru nor in Chile, however, do the plants bear all through the year as they do on the sandy plains near Ambato, Ecuador. I suspect the difference in climatic conditions is the cause of this; on the Equator there are no well-defined seasons and the plants remain active throughout the year; while here in Chile the seasons are fairly well defined and vegetative activity ceases during a part of each year, as with us. The ripening season of *F. chiloensis* in the highlands of southern Peru and central Chile seems to extend, approximately, from the latter part of October to January."

54631. "(No. 654. Santa Ines, Chile. October 6, 1921.) *Frutilla blanca de Chile,* or white Chilean strawberry. This strawberry differs from S. P. I. No. 54630 in the color of its fruits, which are of a much lighter shade of red than those of the latter. It does not seem to be nearly so well known nor so extensively grown in Chile as the common red variety, but it is recommended by Sr. Izquierdo as a large and handsome fruit, highly perfumed. It will be of interest to our strawberry breeders."

54622 to 54643—Continued.

54632. FRAGARIA sp. Rosaceæ. **Strawberry.**

"(No. 655. Cascada del Salto, near Santiago de Chile. October 7, 1921.) This strawberry, of which the varietal name has been lost, is believed by Sr. Izquierdo to have been introduced into Chile from Europe. It may, therefore, be one of the sorts already known in the United States. It succeeds in Chile much better than most other European strawberries, however, and for this reason it seems worthy of introduction into the United States for trial in regions with dry, rather hot climates. The fruits are of good size and excellent quality."

54633. LAURELIA SEMPERVIRENS (Ruiz and Pav.) Tulasne. Monimiaceæ. (*L. aromatica* Juss.) **Chilean laurel.**

"(No. 675. Santa Ines, Chile. October 6, 1921.) *Laurel de Chile.* A handsome tree of southern Chile with dark-green, aromatic foliage. The wood, which is durable and never injured by boring insects, is much used for flooring. For trial on the Pacific coast, where it may be of value as an ornamental plant."

54634. LITHRAEA CAUSTICA (Molina) Hook. and Arn. Anacardiaceæ. (*L. venenosa* Miers.) **Litre.**

"(No. 674. Santa Ines, Chile. October 6, 1921.) A native Chilean tree which resists drought and produces hard wood, employed in the manufacture of carts and wagons. Its leaves are ovate or obovate, thick, and leathery in texture. The flowers, borne in axillary or terminal panicles, are followed by small, white fruits. The sap is caustic and said to be poisonous. For trial in the Southwestern States and on the Pacific coast.

54635 to 54638. MALUS SYLVESTRIS Mill. Malaceæ. **Apple.** (*Pyrus malus* L.)

54635. "(No. 657. Santa Ines, Chile. October 7, 1921.) *Huidobro* apple. Also known as *Araucana* and *Araucana Huidobro.*

"*Huidobro* is said to have originated on the hacienda of Sr. Vicente G. Huidobro in Chile from an Italian seed. The tree is described as very vigorous and productive, the fruit as medium to large, yellow, of firm texture, sweet, aromatic, and juicy. Its ripening season is late autumn (April to May), and the fruits can be kept in good condition, without cold storage, until the following October or sometimes November. Its shipping qualities are excellent.

"*Huidobro* can not be strongly recommended as a dessert apple and, indeed, it is not introduced as such; it has another quality which gives it interest and makes it valuable in Chile and perhaps elsewhere. I refer to its immunity from the attacks of the woolly aphis, perhaps the worst pest of Chilean orchards. Sr. Izquierdo has found that plants of this variety grafted on seedling apple roots will be attacked by the aphis only from the roots upward to the union of stock and scion, not a single insect ever passing on to the scion to carry on his nefarious activities. Because of this characteristic, it is possible that *Huidobro* may have value in the United States as a stock plant on which to graft other and better varieties of the apple.

"The trees of *Huidobro* introduced under the present number are grafted on seedling apple roots."

54636. "(No. 658. Santa Ines, Chile. October 7, 1921.) *Bella Rosa* apple. Described as a medium-sized fruit of firm texture and sweet flavor, recommended for cultivation on a commercial scale. It is immune from the attacks of woolly aphis and is introduced for trial in the United States as a rootstock on which to graft other apples."

54637. "(No. 659. Santa Ines, Chile. October 7, 1921.) *Chestnut* apple. Described as a medium-sized fruit for fall and winter use. Its chief interest lies in its immunity from the attacks of woolly aphis, and it is introduced principally for trial as a rootstock."

54622 to 54643—Continued.

54638. "(No. 660. Santa Ines, Chile. October 7, 1921.) *Reina Cristina* apple. This variety is considered by Sr. Izquierdo the best aphis-resistant apple in Chile. It is said to be a fruit of much better quality than *Huidobro* and worthy of cultivation on a large scale. I doubt if it will prove to be as good as many of our North American apples, but it is worthy of a trial. It should also be tested as a rootstock for other varieties."

54639. PEUMUS BOLDUS Molina. Monimiaceæ. **Boldo.**

"(No. 668. Santa Ines, Chile. October 6, 1921.) A small tree esteemed in Chile for its ornamental and medicinal value. The dried leaves are exported to Europe, where they are employed in diseases of the liver. An infusion of the flowers is also used medicinally. The fruits are eaten, but are not of great value.

"The tree is diœcious and very aromatic in all its parts. It has opposite, rough, short-petioled, ovate leaves; flowers in small axillary racemes; and fruits the size of our northern haws."

54640. POPULUS sp. Salicaceæ. **Poplar.**

"(No. 669. Santa Ines, Chile. October 6, 1921.) Giant poplar of Santa Ines. This tree, more vigorous in growth and ultimately larger than the common poplar of Chile, originated at Santa Ines as a bud sport or mutation. Sr. Izquierdo says of it: 'It grows very rapidly when planted on good soil. Its wood is equal to that of the common poplar, but has few knots because of the rapidity of growth.' Of interest for our Southwestern States."

54641. POPULUS sp. Salicaceæ. **Poplar.**

"(No. 671. Santa Ines, Chile. October 6, 1921.) *Alamo de hoja persistente.* Evergreen poplar. The commonest tree in southern Chile is the *alamo*, or poplar. It is used in place of fences to mark the boundaries of many farms and is planted along numerous roads and avenues. It is commonly a deciduous species, but occasionally trees hold their leaves longer than others and a few are nearly evergreen in character. Sr. Izquierdo has selected one of the latter and has propagated it by cuttings. It seems worthy of trial in our Southwestern States and on the Pacific coast, where it may be of value as a quick-growing ornamental. Its lumber is much used in Chile for rough purposes."

54642. PRUNUS AVIUM L. Amygdalaceæ. **Sweet cherry.**

"(No. 661. Santa Ines, Chile. October 7, 1921.) *Precoz del Salto* cherry (Salto early). This is recommended by Sr. Izquierdo as the best early cherry grown in Chile. It is probably of European origin, but its early history is not known; Sr. Izquierdo found the variety growing at Cascada del Salto when he bought the property a few years ago. Its fruits, which are said to ripen two to three weeks earlier than other cherries cultivated in the same region, are described as medium sized, sweet, and of good quality. The variety is worthy of trial on the Pacific coast."

54643. TIPUANA TIPU (Benth.) Lillo. Fabaceæ. **Tipu.**
(*T. speciosa* Benth.)

"(No. 670. Santa Ines, Chile, October 6, 1921.) *Tipu.* Sr. Izquierdo describes this plant as follows: 'A handsome ornamental tree from the Argentine Republic. It has compact, delicate foliage and is excellent for parks and for planting along streets and avenues. In its native country it is said to grow nearly as rapidly as *Eucalyptus globulus.* In the Botanic Gardens at Buenos Aires it has reached a height of 4½ meters (15 feet) in 31½ months. Plants imported from Argentina have shown much vigor at Santa Ines and have grown even during the winter months. Its wood is useful for furniture and rough purposes. Its horizontal branches make it an excellent shade tree.' For trial on the Pacific coast and in our Southwestern States."

54644 to 54650.

From Santiago, Chile. Plants presented by Instituto Agricola Bunster, Angol, Chile, through Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received November 4, 1921. Quoted notes by Mr. Popenoe.

54644 to 54646. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

"It seemed worth while to obtain for trial in the United States a small collection of Chilean peaches. These should be of especial interest in our Pacific coast and Southwestern States, where the climatic conditions approximate those of Chile. Probably we shall not obtain from the latter country any peaches of better quality than our finest sorts; indeed, this should not be expected, but it seems entirely possible that some of these varieties may prove interesting because of resistance to disease, difference of ripening season, or some other important characteristic. They are, so far as known, varieties which have originated in Chile as seedlings."

54644. "(No. 642. Criadero 'El Verjel,' Angol, Chile. September 29, 1921.) *Maipu* is described as a very productive variety, with large, very sweet fruit having a small stone and ripening in January. The trees which are introduced under this number are budded on stocks of the *Marianna* plum grown from cuttings."

54645. "(No. 643. Criadero 'El Verjel,' Angol, Chile. September 29, 1921.) *Blanquillo de Mayo* peach. This variety is one of the latest which is cultivated in Chile, its ripening season extending into May. It is not a large fruit, but is considered valuable for canning. The tree is said to be very productive. Budded on stocks of the *Marianna* plum."

54646. "(No. 644. Criadero 'El Verjel,' Angol, Chile. September 29, 1921.) *Monstruoso amarillo de Viña del Mar* (large yellow from Vina del Mar) peach. This variety produces fruits of large size, as indicated by the name. The flesh is yellow and of excellent quality. Freestone. The ripening season in Chile is during February. The plants introduced under this number are budded on *Marianna* plum grown from cuttings."

54647 to 54649. MALUS SYLVESTRIS Mill. Malaceæ. **Apple.**
(*Pyrus malus* L.)

54647. "(No. 645. Criadero 'El Verjel,' Angol, Chile. September 29, 1921.) *Huidobro* apple."

For previous introduction, see S. P. I. No. 54635.

54648. "(No. 647. Criadero 'El Verjel,' Angol, Chile. September 29, 1921.) *Verjel* apple. This variety originated at the Criadero 'El Verjel,' of which the Instituto Agricola Bunster is the successor. It is remarkable because of its lateness in flowering, and for this reason is considered valuable. Early-flowering varieties run the risk in southern Chile of having the crop destroyed by late frosts or of being injured by the excessive and cold rains which occur.

"*Verjel* is described as a medium-sized, sweet apple. Messrs. Crouse and Reed, of the Instituto Agricola Bunster, tell me that it is rather inferior in quality and not likely to meet with favor in the United States. It is introduced mainly for trial as a stock plant; very possibly its tardiness in commencing vegetative activity in the spring might be transmitted, in some measure at least, to other varieties grafted upon it. The tree is said to be notably productive here in southern Chile.

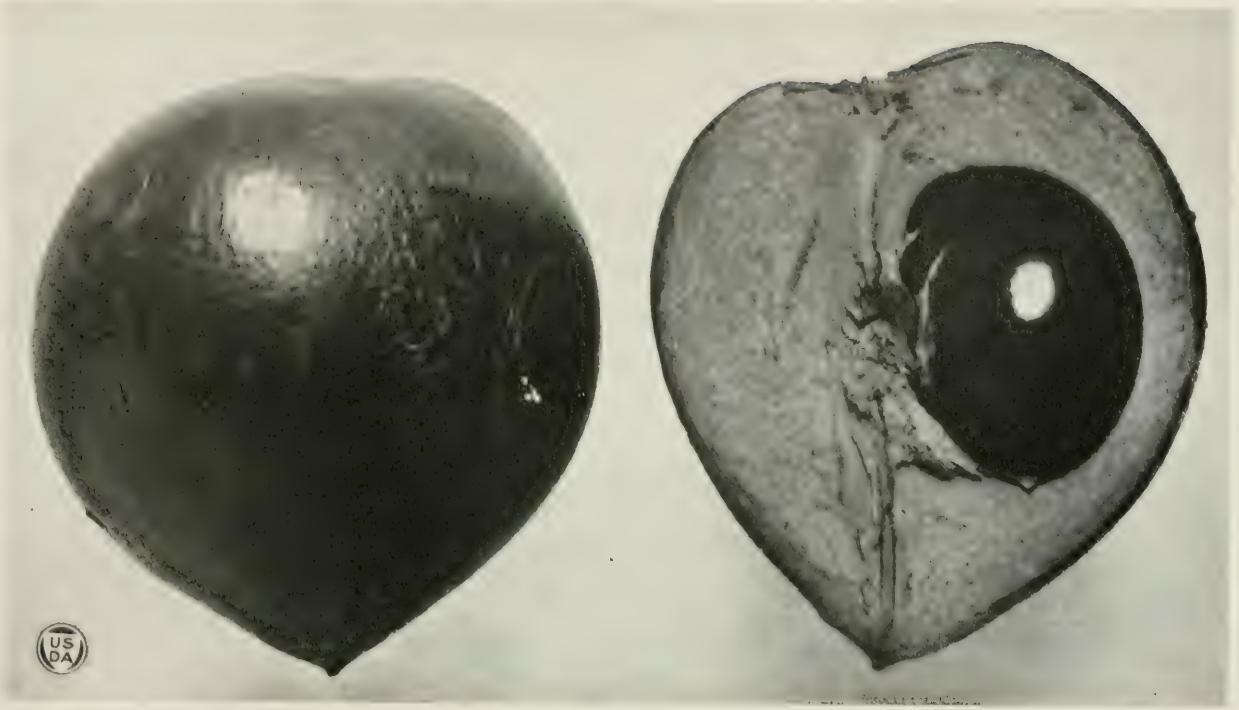
"The plants sent under this number are on seedling apple roots."

54649. "(No. 648. Criadero 'El Verjel,' Angol, Chile. September 29, 1921.) *Puchacay tempranera* (Early Puchacay) apple. Albert Reed, of the Instituto Agricola Bunster, tells me that this apple ripens at the same season as *Duchess of Oldenburg*, and that it is



FRUITS OF THE CAPUCHIN ORANGE, NATURAL SIZE. (CITRUS SINENSIS (L.) OSBECK, S. P. I. No. 54651.)

When grown in the climate of central Chile, this variety strongly resembles in appearance and flavor the Washington navel orange of California. Its fruits are slightly too sour for Chileans, who, in common with other South Americans, prefer sweet fruits to those which are subacid. The Capuchin orange, which is believed to have originated in a monastery at Santiago de Chile, seems worthy of cultivation in other countries for its ornamental value, as well as for the usefulness of its fruit. (Photographed by Wilson Popenoe, Santiago de Chile, October 7, 1921; P18894FS.)



THE LUCMA, A POPULAR FRUIT IN CHILE. (LUCUMA OBOVATA H. B. K., S. P. I. No. 54653.)

This little-known species is cultivated in parts of Ecuador, Peru, and Chile. The dull-green russet-blotched fruit has a thin skin and sweet, mealy, deep-yellow flesh, in flavor resembling somewhat the sapote or Ti-es of southern Florida. (Photographed, natural size, by Wilson Popenoe, Santiago de Chile, October 3 ,1921; P18836FS.)

54644 to 54650—Continued.

for a summer apple, of very fair quality. Salvador Izquierdo considers it to be synonymous with the European variety *Calville Rouge d'Ete*. It is widely and favorably known in Chile and is introduced into the United States with the idea that it may be a variety of Chilean origin, slightly distinct from the last-named sort (with which, I take it, North American pomologists are already familiar).

"*Puchacay tempranera* is described as a large, handsome fruit, with aromatic, sweetly acidulous flesh of excellent quality. It ripens in southern Chile in January and February.

"The plants sent under this number are on seedling apple roots."

54650. PRUNUS AVIUM L. Amygdalaceæ. **Sweet cherry.**

"(No. 646. Criadero 'El Verjel,' Angol, Chile. September 29, 1921.) *Tardia de El Verjel* (Verjel late) cherry. This is a cherry which was first disseminated by the Criadero 'El Verjel,' of which the Instituto Agricola Bunster is the successor. It is either a seedling of one of the European cherries or else a variety brought originally from Europe and given a new name in Chile. It is described as a large, bright rose-colored fruit ripening in January (which is late for cherries in Chile). The tree is recommended as very productive.

"It is not probable that this variety will prove to be valuable in the United States. Because of its lateness in ripening, however, and the likelihood that it is of Chilean origin it is worthy of a trial, especially in those regions of the United States whose climate is similar to that of central and southern Chile.

"Plants grafted on seedling cherry roots."

54651. CITRUS SINENSIS (L.) Osbeck. Rutaceæ. **Sweet orange.**

From Santiago, Chile. Plants and cuttings presented by Sr. Salvador Izquierdo, through Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received November 4, 1921.

"(No. 656. Cascada del Salto, near Santiago, Chile. October 7, 1921.) *Capuchin* orange. This appears to me to be a dwarf form of the common sweet orange. Its origin is unknown; Sr. Izquierdo tells me that it was grown formerly in the monastery of the Capuchin monks, which fact accounts for its common name of *Capuchin* orange. In recent years it has been propagated by Sr. Izquierdo and disseminated on a small scale throughout the citrus-growing regions of Chile.

"The tree is much smaller than that of the common sweet orange but is not otherwise distinguishable from the latter so far as I have been able to ascertain. The fruits, which are borne in great profusion, are from 1½ to 2 inches in diameter, round, deep orange, with a rather thin skin and orange-colored flesh containing an abundance of juice. The flavor is much like that of the Washington Navel orange, and the seeds are very few. The ripening season in Chile coincides with that of the Washington Navel. The fruits are somewhat acid for Chileans, who commonly prefer a very sweet orange, but they will, I believe, be found very acceptable to the North American palate. Because of its dwarf character and its decorative value when in fruit, I believe the variety worthy of cultivation in dooryards and perhaps as a house plant." (*Popenoe.*)

For illustrations of the Capuchin orange, see Plates IV and V.

54652. VITIS VINIFERA L. Vitaceæ. **Grape.**

From Chile. Cuttings presented by Prof. John W. Gilmore, through Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received November 4, 1921.

"(No. 677.) These cuttings were obtained by Professor Gilmore in the Elqui Valley, some distance north of Santiago. This is the grape which furnishes the Huasco raisin, well known throughout Chile. I have examined some of these raisins and find them lighter in color than the muscatel raisins of California,

with very few and small seeds, and with a mild, very pleasant flavor, somewhat less rich than that of the California product. The method of drying which is practiced in the Elqui Valley is a curious one. The grapes are taken from the vine to a small house or shed, in which they are suspended from the rafters; the sun never touches them during the drying process." (*Popenoe.*)

54653. Lucuma obovata H. B. K. Sapotaceæ. **Lucma.**

From Santiago, Chile. Seeds collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received November 7, 1921.

"(No. 652a. Santiago, Chile. October 3, 1921.) Seeds from fruits purchased in the market. This is a little-known fruit cultivated in various parts of Ecuador, Peru, and as far south as Santiago, Chile. It is not highly esteemed in Ecuador, but is popular in central Chile, where the fruits seem to be of better quality than in the former country. The tree reaches 40 feet in height, and when well grown it has a round, dense crown of very attractive appearance. The leaves, which are clustered toward the ends of the branchlets, are obovate, oval or elliptic in outline, subacute at the base, and rounded at the apex, commonly 5 to 10 inches long, deep green, with the margins entire. The small flowers are produced in great abundance along the branches; they are three-fourths of an inch long, the corolla tubular, deeply five toothed, and pale green in color. The fruit is round to elliptic, sometimes with a sharp point at the apex, and commonly 3 to 4 inches long. The surface is deep brownish green, heavily marked or overspread with russet. The skin is very thin and easily broken. The flesh is deep yellow, dry, mealy, and very sweet, resembling in flavor that of the sapote and the *ti-cs*, or egg fruit, of southern Florida. The seeds are one or two in number, broadly oval, about 1¾ inches long, dark brown and glossy, especially on the flattened and whitish ventral surface.

"The lucma, as this fruit is called in Chile, is probably too tender for cultivation in California, but will perhaps succeed in southern Florida." (*Popenoe.*)

Fruits of the lucma are shown in Plate VI.

54654 to 54658.

From Tourane, Anam, French Indo China. Seeds presented by F. A. McClure, instructor, Canton Christian College. Received November 10, 1921. Quoted notes by Mr. McClure.

54654. Artocarpus integra (Thunb.) L. Moraceæ. **Jack fruit.** (*A. integrifolia* L.)

"Seeds of the *jack fruit* secured on the market at Hue, Anam, September 30, 1921. Chinese name: *Poh loh mat.*"

For previous introduction, see S. P. I. No. 51012.

54655. Dracontomelon sinense Stapf. Anacardiaceæ.

"Chinese name: *Yan min* or *ngan nim.* The seeds were secured on September 24, 1921, from L. Laforge, who is in charge of the public gardens and trees of Hanoi, Tonkin. The trees from which the fruits were taken are from 8 to 10 meters (26 to 33 feet) in height and are growing along some of the avenues and in the botanic gardens at Hanoi. The soil is fertile delta silt loam, poorly drained. The trees seem to be growing better than ours at the college, which are in tight clay.

"The brownish yellow ovoid fruits are from 3.5 to 5 centimeters (1 to 2 inches) in diameter. The taste is pleasant, but slightly acid."

54656. Garcinia sp. Clusiaceæ.

"Seeds of a fruit secured from a tree growing in a thicket surrounding a Chinese ancestral hall about 4 kilometers (2⅔ miles) southeast of Hue, Anam. The Chinese name is *shaan chuk;* local name, *maang tuk.*

"The tree from which the seeds were taken is about 10 meters (33 feet) in height and 25 centimeters (10 inches) in diameter, breast high. The soil in which it is growing is rich, brown sandy loam, and rather moist.

54654 to 54658—Continued.

"The light-yellow fruit is from 3 to 5 centimeters (1 to 2 inches) in diameter, slightly oval, with a slight prominence at the stem end. It has a pleasant odor and the flavor is delicate, similar to that of the mangosteen which we sometimes get on the Canton market."

54657. GARCINIA sp. Clusiaceæ.

"The tree from which the fruit was secured is about 8 meters (26 feet) in height and 20 centimeters (8 inches) in diameter breast high. It is growing in the edge of a thicket on a mountain side near Hue, about 50 meters (164 feet) above sea level.

"Unfortunately, I could get only a few seeds. The fruit evidently is closely related to S. P. I. No. 54656. It is, however, more plump, and flatter in shape, lighter yellow in color, and distinctly inferior in flavor and quality. The fruit is found commonly for sale in the streets of Hue. Local name: *Tai t'oi.*"

54658. SEVERINIA BUXIFOLIA (Poir.) Ten. Rutaceæ.

"Seeds from sand waste near Tourane, Anam. Secured October 2, 1921. Chinese name: *Tsau peng lak*, known also as *saan kat* and *kau kwat lak*. There was a great deal of variation among the plants observed, some being tall (3 to 4 feet) with long thorns and large leaves and others being short (1 foot), with short, very sharp thorns and small leaves. I collected seeds from the specimens which seemed to be most promising as grafting stock for citrus, being larger and freer from thorns than usual."

A handsome much-branched, spiny shrub which can withstand unusually large amounts of salt in the soil. It may be of use as a stock for citrus fruits in regions having alkali in the soil or having salty irrigation water. The boxlike leaves are shiny above and the small, dark-red, berrylike fruits, half an inch in diameter, become nearly black as they ripen. The plant is readily propagated from cuttings and is suitable for hedges. Native to southern China, Annam, Formosa, and Tonkin. (Adapted from *Journal of the Washington Academy of Sciences, vol. 6, p. 651.*)

For previous introduction, see S. P. I. No. 24433.

54659. QUERCUS ILEX L. Fagaceæ. **Oak.**

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received November 23, 1921.

A large handsome evergreen tree, sometimes reaching a height of 70 to 90 feet, native to the Mediterranean region and cultivated in Europe as an ornamental. The mature leaves are a dark glossy green and usually narrowly oval. The tree prefers a warm light soil and is perfectly hardy in the southern and western parts of England. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 311.*)

54660 to 54662. DIOSCOREA spp. Dioscoreaceæ.

From Orleans, France. Tubers presented by E. Versin, St. Jean le Blanc. Received December 23, 1921. Quoted notes by R. A. Young.

54660. DIOSCOREA BATATAS Decaisne. **Chinese yam.**

"*Chappellier.* A somewhat short-tubered variety of the Chinese yam which in the unimproved state produces very long, slender tubers. The flesh is very white and of good quality. This species is adapted for growing in temperate regions."

54661. DIOSCOREA JAPONICA Thunb. **Japanese yam.**

"A white-fleshed, thin-skinned yam of good quality. The tubers are long and slender; a specimen 13 inches long was 1½ inches in greatest diameter and weighed 5 ounces."

54662. DIOSCOREA VILLOSA L. **Wild yam-root.**

"A slender-tubered yam with moist, white flesh of rather inferior quality. A specimen 16 inches long was 1½ inches in greatest diameter and weighed 9 ounces."

54663. ANANAS SATIVUS Schult. f. Bromeliaceæ. **Pineapple.**

From Limon, Costa Rica. Slips presented by G. P. Chittenden, manager, Costa Rica division, United Fruit Co., through Paul V. Siggers, pathologist for the United Fruit Co., Costa Rica. Received December 20, 1921.

"The *Chocoana* pineapple is commercially cultivated on the island of Taboga, in the Gulf of Panama, whence the fruit is shipped to Panama, Colon, and other cities of the Canal Zone. It is a medium-sized fruit, weighing 2 to 3 pounds, slender and rather tapering in form, externally yellowish green. The white, juicy flesh is sweet and of delicate flavor, making the fruit an excellent one for dessert use, though probably not well adapted for canning." (*Wilson Popenoe.*)

54664 to 54670.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received December 22, 1921.

54664 to 54669. BUTIA spp. Phœnicaceæ. **Palm.**

Notes adapted from an article by Dr. Robertson Proschowsky on "The Butias as Fruit Palms for Temperate Climates," Gardeners' Chronicle, 3d ser., vol. 70, p. 260.

54664. BUTIA CAPITATA DELICIOSA Proschowsky.

The fruits are almost globular, of a beautiful orange color, and have a rose-colored base. They are the size of large cherries and somewhat smaller than those of *Butia capitata pulposa*. The flesh, though of good thickness, is just a little less abundant than in *B. capitata pulposa*, but by continued selection and hybridization there is every reason to believe that still superior varieties can be raised, of larger size and of different flavors, absolutely fiberless, with abundant flesh and smaller seeds.

54665. BUTIA CAPITATA LILACEIFLORA (Chab.) Beccari.
(*Cocos lilaceiflora* Chab.)

Fruits of orange color, about the size of those of *Butia capitata deliciosa*, but usually a little more flattened; base of fruits somewhat rose colored: taste acidulous, agreeable; contains rather many fibers, but these are fine, and many persons eat all the flesh, including the fibers.

54666. BUTIA CAPITATA ODORATA (Barb.-Rodr.) Beccari.
(*Cocos odorata* Barb.-Rodr.)

Fruits somewhat variable as to size, ranging from that of small to ordinary cherries, but flattened, of light-orange color, the base very slightly rose colored. Flesh fibrous, taste acidulous, like that of *Butia capitata lilaceiflora*. The agreeable perfume found in all the varieties of *B. capitata* is most pronounced in this variety, hence the varietal name.

For previous introduction, see S. P. I. No. 45073.

54667. BUTIA CAPITATA PULPOSA (Barb.-Rodr.) Beccari.
(*Cocos pulposa* Barb.-Rodr.)

Fruits the largest of all, somewhat depressed (flattened), of light-yellow color with rose-colored base. Rather abundant flesh of very good taste, somewhat sweeter than that of *Butia capitata deliciosa*, the taste resembling, perhaps, mostly a mixture of peach and apricot; containing fibers, but not to such an extent as to prevent some persons eating the whole. The seeds are large, about twice the size of those of *B. capitata deliciosa*.

For previous introduction, see S. P. I. No. 51890.

54668. BUTIA CAPITATA PYGMAEA Proschowsky.

The flesh is not very abundant; though very fibrous, the acidulous taste is not much inferior to that of *Butia capitata odorata*. This tiny palm has the merit of being especially adapted to pot culture.

54664 to 54670—Continued.

The small seeds, inclosed in the hard endocarp, have kernels of very good taste, like that of the well-known coconut (*Cocos nucifera*). If a way could be found of extracting these seeds without crushing them, there could undoubtedly be found ample use for them.

54669. BUTIA CAPITATA SUBGLOBOSA Beccari.

Fruit the size of ordinary cherries, of very light yellow color, red at the base, almost globose, as the name indicates; flesh nearly fiberless, of acidulous, sweetish flavor, but having a slightly bitter taste.

54670. RAPHIOLEPIS UMBELLATA (Thunb.) C. Schneid. Malaceæ. (*R. japonica* Sieb. and Zucc.)

"Fresh seeds (berries) of a beautiful evergreen, very hardy bush which will, I think, thrive in the southeastern parts of the United States, at least as far as North Carolina." (*Proschowsky.*)

54671 and 54672. ORYZA SATIVA L. Poaceæ. **Rice.**

From Kagoshima, Japan. Seeds presented by K. Tamari, Kagoshima Imperial College of Agriculture and Forestry. Received December 8, 1921.

54671. Scented rice from Hioki County.

54672. Scented rice from Kimotsuki County.

54673 and 54674. MUSA spp. Musaceæ. **Banana.**

From Honolulu, Hawaii. Shoots presented by Willis T. Pope, horticulturist, Agricultural Experiment Station. Received November 28, 1921.

54673. MUSA FEHI Bert.

"*Tahitian, Fehi,* or *Barabora.* The shoots of this variety are very long and slim while young. A red, upright-fruiting variety in Hawaii." (*Pope.*)

54674. MUSA PARADISIACA SAPIENTUM (L.) Kuntze.

"*Honduranian Common,* known as the *Brazilian banana* in Honolulu." (*Pope.*)

A large commercial variety of good quality.

For previous introduction, see S. P. I. No. 38923.

54675. DIOSCOREA CAYENENSIS Lam. Dioscoreaceæ. **Yellow Guinea yam.**

From Port Antonio, Jamaica, British West Indies. Tubers presented by E. R. Sasscer, United States Department of Agriculture. Received December 14, 1921.

"Yam taken from the cargo of the American steamship *Bella,* from Port Antonio, Jamaica. The specimen was collected at Baltimore, Md." (*Sasscer.*)

"A yellow-fleshed yam which produces individual tubers up to 2 pounds or more in weight. The flavor of this yam is less delicate than that of some, and the flesh is quite firm, but the texture is good and the color attractive." (*R. A. Young.*)

54676. SOLANUM BULLATUM Vell. Solanaceæ

From Lavras, Minas Geraes, Brazil. Seeds presented by Benjamin H. Hunnicutt, director, Instituto Evangelico, Escola Agricola de Lavras, through C. C. Knight, vice director. Received December 29, 1921.

A South American plant of considerable interest for experimental use as a forage plant because of its large percentage of protein.

For previous introduction, see S. P. I. No. 51802.

INDEX OF COMMON AND SCIENTIFIC NAMES.

Acacia pycnantha, 54439.
Actinidia chinensis, 54460.
Aesculus turbinata, 54524.
Agati grandiflora, 54468.
 tomentosa, 54516.
Amerimnon latifolium, 54554, 54555.
Amygdalus persica, 54441, 54622–54625, 54644–54646.
 persica nectarina, 54626.
Ananas sativus, 54663.
Andropogon rufus. See *Cymbopogon rufus*.
Annona muricata, 54527.
 purpurea, 54528.
Apple, *Malus sylvestris:*
 Bellä Rosa, 54636.
 Chestnut, 54637.
 Huidobro, 54635, 54647.
 Puchacay tempranera, 54649.
 Reina Christina, 54638.
 Verjel, 54648.
Apricot, *Prunus armeniaca:*
 Ájami, 54442.
 Áshami, 54442.
 Baalbek, 54444.
 Baladi, 54443.
Aristolochia sp., 54536.
Artocarpus integra, 54654.
 integrifolia. See *A. integra*.
Avena sativa, 54540, 54541.
Avocado, *Persea americana*, 54520.

Bamboo, *Bambos tulda*, 54449.
 Dendrocalamus sp., 54457.
 brandisii, 54429.
 sikkimensis, 54450.
 Melocanna baccifera, 54430.
Bambos tulda, 54449.
Banana. See *Musa* spp.
Bauhinia flammifera, 54472.
 variegata, 54462.
Bean, soy, *Soja max*, 54561–54620.
Bellflower, Chilean, *Lapageria rosea*, 54459, 54621.
Bellota miersii, 54627.
Belloto, *Bellota miersii*, 54627.
Benincasa cerifera. See *B. hispida*.
 hispida, 54426, 54428.
Boldo, *Peumus boldus*, 54639.
Butia capitata deliciosa, 54664.
 capitata lilaceiflora, 54665.
 odorata, 54666.
 pulposa, 54667.
 pygmaea, 54668.
 subglobosa, 54669.

Calotropis procera, 54451.
Canarium ovatum, 54434.
Canna flaccida × *iridiflora*, 54437.
Capsicum annuum, 54531.
Carica sp., 54529.
Carob, *Ceratonia siliqua*, 54452, 54453.
Caryophyllus malaccensis, 54489, 54530.
Cassia siamea, 54463.
Ceratonia siliqua, 54452, 54453.
Chaetochloa italica, 54438.
Chayota edulis, 54517–54519.
Chayote, *Chayota edulis*, 54517–54519.
Cherry, sweet, *Prunus avium*, 54642, 54650.
Chloris myriostachya, 54556.
Chorisia speciosa, 54551.
Citrus sinensis, 54651.
Clover, red, *Trifolium pratense*, 54456, 54467, 54488, 54492, 54493.
Cocos lilaceiflora. See *Butia capitata lilaceiflora*.
 odorata. See *Butia capitata odorata*.
 pulposa. See *Butia capitata pulposa*.
Coelococcus amicarum, 54515.
Coix lacryma-jobi ma-yuen, 54454, 54455.
Cotton. See *Gossypium* spp.
Crinodendron patagua, 54628.
Cryptocarya peumus. See *C. rubra*.
 rubra, 54629.
Cucumis melo, 54445, 54473, 54510, 54511.
Cucurbita moschata, 54427.
Currant, garden, *Ribes vulgare*, 54474.
Cymbopogon rufus, 54447, 54557.
Cyphomandra sp., 54552.

Dalbergia latifolia. See *Amerimnon latifolium*.
Datura leichhardtii, 54525.
Dendrocalamus sp., 54457.
 brandisii, 54429.
 sikkimensis, 54450.
Dioscorea batatas, 54660.
 cayenensis, 54675.
 japonica, 54499, 54661.
 villosa, 54662.
Dracontomelon sinense, 54655.

Echinochloa crusgalli edulis, 54440, 54494–54496.

Eragrostis sp., 54558.
Erythrina variegata, 54464.
Eucalyptus gunnii, 54469.
obliqua, 54506.
Eugenia malaccensis. See *Caryophyllus malaccensis*.

Fragaria sp., 54632.
chiloensis, 54630, 54631.

Garcinia spp., 54656, 54657.
spicata, 54470.
Glycine hispida. See *Soja max*.
Gossypium spp., 54465, 54466, 54501.
barbadense, 54508.
Gourd, wax, *Benincasa hispida*, 54426.
Granadilla, *Passiflora edulis*, 54512.
Grape, *Vitus vinifera*, 54652.
Grass, Congo, *Pennisetum purpureum*, 54513.
elephant, *Pennisetum purpureum*, 54513.
Eragrostis sp., 54558.
finger, *Chloris myriostachya*, 54556.
Himalaya, *Pennisetum orientale triflorum*, 54553.
jaragua, *Cymbopogon rufus*, 54447, 54557.
molasses, *Melinis minutiflora*, 54448.
Tricholaena sp., 54559.
Vetiveria nigritana, 54560.
Guava, *Psidium guajava*, 54491.

Holcus sorghum, 54435, 54436, 54471, 54475–54487, 54537–54539.
Horse-chestnut, Japanese, *Aesculus turbinata*, 54524.

Jack fruit, *Artocarpus integra*, 54654.

Kankri, *Cucumis melo*, 54510.
Kopsia arborea, 54549.

Lapageria rosea, 54459, 54621.
Laurel, Chilean, *Laurelia sempervirens*, 54633.
Laurelia sempervirens, 54633.
aromatica. See *L. sempervirens*.
Lecythis zabucajo, 54509.
Lettuce tree, *Pisonia alba*, 54500.
Lithraea caustica, 54634.
venenosa. See *L. caustica*.
Litre, *Lithraea caustica*, 54634.
Lucma, *Lucuma obovata*, 54653.
Lucuma obovata, 54653.
Lycopersicon esculentum, 54505.

Malus sylvestris, 54635–54638, 54647–54649.
Mamoncillo, *Melicocca bijuga*, 54521, 54523.
Mangifera indica, 54526.
Mango, Père Louis, *Mangifera indica*, 54526.
Ma-yuen, *Coix lacryma-jobi ma-yuen*, 54454, 54455.
Melicocca bijuga, 54521, 54523.
Melinis minutiflora, 54448.
Melocanna baccifera, 54430.
bambusoides. See *M. baccifera*.
Millet, *Chaetochloa italica*, 54438.
barnyard, *Echinochloa crusgalli edulis*, 54440, 54494–54496.
Mombin, yellow, *Spondias mombin*, 54532, 54533.
Musa fehi, 54673.
paradisiaca sapientum, 54674.
Muskmelon, *Cucumis melo*:
Zanzur, 54445.
Kankri, 54510.
Mammoth Yellow, 54511.
Escrito, 54473.

Nectarine, Cardinal Mora, *Amygdalus persica nectarina*, 54626.

Oak. See *Quercus* spp.
Oats, *Avena sativa*:
Echo, 54540.
Fortune, 54541.
Ohia, *Caryophyllus malaccensis*, 54489, 54530.
Olea europaea, 54547, 54548.
Olive, *Olea europaea*, 54547, 54548.
Orange, sweet, *Citrus sinensis*, 54651.
Capuchin, 54651.
Oryza sativa, 54671, 54672.

Palm, apple-nut, *Cocloccoccus amicarum*, 54515.
Butia spp., 54664–54669.
Paradise nut, *Lecythis zabucajo*, 54509.
Passiflora edulis, 54512.
Patagua, *Crinodendron patagua*, 54628.
Peach, *Amygdalus persica*:
Alemendruco, 54625.
Blanquillo de Mayo, 54645.
Derrak, 54441.
Maipu, 54644.
Monstruoso amarillo de Viña del Mar, 54646.
Transparente de Conservas, 54624.
Unnamed, 54622, 54623.
Penniscetum orientale triflorum, 54553.
purpureum, 54513.
Pepper, *Capsicum annuum*, 54531.
Persea americana, 54520.
gratissima. See *P. americana*.
Peumo, *Cryptocarya rubra*, 54629.
Peumus boldus, 54639.
Physalis alkekengi, 54504.
peruviana, 54514.
Pili nut, *Canarium ovatum*, 54434.
Pineapple, *Ananas sativus*, 54663.
Pisonia alba, 54500.
Poha, *Physalis peruviana*, 54514.
Poplar. See *Populus* spp.
Populus spp., 54640, 54641.
Prunus armeniaca, 54442–54444.
avium, 54642, 54650.
persica. See *Amygdalus persica*.
Psidium guajava, 54491.
Pyrus malus. See *Malus sylvestris*.

Quercus ilex 54659.
lanuginosa, 54502.
pubescens. See *Q. lanuginosa*.
serrata, 54433.

Raspberry, *Rubus* spp.:
Lloyd George, 54497.
Perfection, 54498.
Raphiolepis japonica. See *R. umbellata*.
umbellata, 54670.
Ribes nigrum × *reclinatum*, 54507.
vulgare, 54474.
Rice, *Oryza sativa*, 54671, 54672.
Rosa sp., 54522.
odorata, 54490.
Rose. See *Rosa* spp.
Rubus spp., 54497, 54498.
Rye, Storm, *Secale cereale*, 54542.

Saccharum officinarum, 54545, 54546.
Secale cereale, 54542.
Sechium edule. See *Chayota edulis*.
Sesbania grandiflora. See *Agati grandiflora*.
tomentosa. See *Agati tomentosa*.
Setaria italica. See *Chaetochloa italica*.
Severinia buxifolia, 54658.
Shisham, *Amerimnon latifolium*, 54554, 54555.
Soja max, 54561–54620.
Solanum bullatum, 54676.
Soncoya, *Annona purpurea*, 54528.
Sorghum, *Holcus sorghum*:
Abgara dura, 54475.
Black, 54537.
Brown, 54539.
Dura Safra, 54476.
Faterita, 54477–54483.
Gahan (?) dura, 54484.
Gassabi dura, 54485.
Hamisi dura, 54486.
Klakah, 54538.
No. 61, 54436.
(unnamed) 54471.
Wad el Fahl, 54487.
Saccaline, 54435.
Sorghum vulgare. See *Holcus sorghum*.
Soursop, *Annona muricata*, 54527.
Spondias sp., 54534.
mombin, 54532, 54533.
Squash, *Cucurbita moschata*, 54427.
Sterculia sp., 54535.
Strawberry, *Fragaria* sp., 54632.
Chilean, *Fragaria chiloensis*, 54630, 54631.
Strychnos sp., 54503.
Sugar cane, *Saccharum officinarum*:
2714 POJ, 54545.
2725 POJ, 54546.

Thespesia lampas, 54550.
Tibouchina sp., 54446.
Tipu, *Tipuana tipu*, 54643.
Tipuana speciosa. See *T. tipu*.
tipu, 54643.
Tithonia diversifolia, 54458, 54461.
Tomato, *Lycopersicon esculentum*, 54505.
Tricholaena sp., 54559.
Tricuspidaria dependens. See *Crinodendron patagua*.
Trifolium pratense, 54456, 54467, 54488, 54492, 54493.
Triticum aestivum, 54543, 54544.
durum, 54431, 54432.
vulgare. See *T. aestivum*.

Vetiveria nigritana, 54560.
Vitis vinifera, 54652.

Wheat, *Triticum* spp:
common, Iduna, 54543.
Standard, 54544.
durum, Triminia, 54431.
Tripshiro, 54432.
Worcester berry, *Ribes nigrum* × *reclinatum*, 54507.

Yam, Chinese, *Dioscorea batatas*, 54660.
Guinea, yellow, *D. cayenensis*, 54675.
Japanese, *D. japonica*, 54499, 54661.
Yam-root, *D. villosa*, 54662.
Yang-tao, *Actinidia chinensis*, 54460.

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Issued November, 1923.

U. S. DEPARTMENT OF AGRICULTURE.
BUREAU OF PLANT INDUSTRY.

INVENTORY

OF

SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
DURING THE PERIOD FROM JANUARY 1
TO MARCH 31, 1922.

(No. 70; Nos. 54677 to 54968.)

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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INTRODUCTORY STATEMENT.

Although a small inventory, as inventories go, this seventieth one has many new plants which are worthy of mention.

The ka-á he-é (*Stevia rebaudiana*, No. 54677) of Paraguay seems to merit serious consideration as a new source of sweetening, particularly for diabetics, since its glucosid has a sweetening power 150 to 200 times greater than that of sugar. The fact that it has never been cultivated should not deter us from attempting its culture, and since it grows somewhat like our ironweeds it might be harvested by machinery. Glucosids differ from sugars in that they are not foods.

The jaragua grass from Brazil (*Cymbopogon rufus*, No. 54679) is a tall, leafy bunch-grass which can be grazed or cut for hay. It is already being extensively tried in southern Florida.

The molasses grass (*Melinis minutiflora*, No. 54680) of Brazil, one of the best forage grasses of that country, appears to have a great future on the sandy lands of Florida. At first, cattle there refused to eat it, but it has been learned that they were turned out to pasture on it after it had become old and coarse. When this grass is young, cattle are very fond of it.

The chirimoriñon (*Annona* sp., No. 54682) according to H. Pittier, of Caracas, is by far the most delicious of the anonas, and it may become another delicate fruit for southern Florida and our island possessions.

Mesua ferrea (No. 54687), a large, handsome tropical tree with blood-red young foliage, large white scented flowers, and seeds which yield a perfumed oil, may easily add another glory to the tropical vegetation of southern Florida.

Solanum pierreanum (No. 54695), the olombé of French Equatorial Africa, whose fire-red fruits the size of walnuts are eaten by the Pahouins, or natives of Gabon colony, might possibly be crossed with the tomato.

The chilacayote (*Cucurbita ficifolia*, No. 54700), a member of the cucumber family from Mexico, the fruits of which resemble small watermelons and are used for pie and for making conserves, may be well worth growing in the vegetable gardens of the South.

Eugenia klotzschiana (No. 54702), the pera do campo, is a pear-shaped fruit which was first featured by Dorsett and Popenoe in their introductions from Brazil because of its most unusual fragrance,

which attracted their attention hundreds of yards away when found on the prairies of Brazil. It should be brought into cultivation because of its fragrant edible fruits.

Aleurites montana (No. 54703), the mu-oil tree of southern China, from which a part of the wood oil of commerce is derived, is a more tropical tree than the tung-oil tree (*A. fordii*) and may prove more productive in parts of Florida than the latter, which is being exploited there.

The Sumatra Casuarina (No. 54705) is a more attractive-looking tree than the ordinary Australian one, and if it proves as hardy and as rapid a grower it may take the place of this so-called Australian pine in southern Florida as a street tree.

The pink shower (*Cassia grandis*, No. 54706), although an exceedingly handsome tree 50 feet or more in height, with abundant clusters of deep-pink flowers which open in early spring, seems curiously enough never to have been naturalized in southern Florida. Its advent there may cause a sensation among amateur horticulturists.

A superb collection of 17 varieties of *Prunus mume* (Nos. 54709 to 54725) has been sent us by Prof. T. Onda for propagation and trial. It seems strange that so little has been done in America with these remarkable Japanese dooryard trees, especially when one considers their fragrance, their picturesque habit, and the exquisite varieties still in existence which were produced by the gardeners of the feudal days of Japan.

From Chiengmai, Siam, J. F. Rock, our agricultural explorer, sends in a quantity of seeds of another source of chaulmoogric acid. *Hydnocarpus anthelminthica* (No. 54726), which may prove more adaptable for cultivation than the true chaulmoogra tree, *Taraktogenos kurzii*.

Rosa gentiliana (No. 54735) was first introduced by us several years ago for the use of the late Dr. Walter Van Fleet, and it has done remarkably well on his place at Bell, Md. When Doctor Van Fleet started for Florida last winter, he took with him a cutting from his bush, thinking that it would be particularly adapted to the South. After the doctor's death, Mrs. Van Fleet gave the slip to Mr. Simmonds, who reports that it is growing well at the Miami Garden.

Danthonia setacea (No. 54736) is one of the pasture grasses of Tasmania and New South Wales. The established value of these danthonias as pasture grasses in Australia makes them worthy of special trial in our own Southwest where, like so many of the introduced grasses, they may prove superior to our native species because of their resistance to drought.

The kangaroo grass of Australia (*Themeda australis*, No. 54737), though coarse, is liked by cattle and sheep. It may seed better in this country than in its native land and prove a valuable addition to southern pastures.

Mr. Popenoe's description of the pejibaye (*Guilielma utilis*, No. 54776) should appeal to horticulturists throughout the Tropics, for it describes a valuable food plant which appears to have been strangely overlooked by the inhabitants of the Tropics of South

America, Africa, and the Orient. It deserves, in Mr. Popenoe's opinion, to rank with the date as a food-producing palm.

A single bush of the grumichama of Brazil has proved hardy in southern Florida, withstanding the freeze of 1917, and it has bloomed profusely there. Its excellent cherrylike fruits and its dark-green foliage and white flowers will probably make it very popular wherever it can be grown. It is interesting to get seeds of it (*Eugenia dombeyi*, No. 54777) and a favorable opinion regarding it from Mr. Regnard, of Mauritius.

Davidsonia pruriens (No. 54785), from Queensland, with acid, plumlike purple fruits the size of a goose egg, used by the settlers for jams and jellies, may prove to be a useful fruit tree in southern Florida and California.

The walnuts (*Juglans regia*, Nos. 54788 to 54790) from the lower Himalayas in the Northwest Provinces of India, according to Howard Spence who sends them, have special vigor and hardiness and on account of the ease with which they can be transplanted are believed valuable as a stock.

Through Henry S. Wellcome we received from Kordofan seeds of the hashab (*Acacia verek*, No. 54799), the acacia which furnishes the finest quality of gum arabic.

A variety of sugar cane (*Saccharum officinarum*, No. 54902) which originated in the Shahjahanpur Sugar-Experiment Station of British India and has shown a remarkable resistance to frost in Queensland may prove of unusual value to sugar-cane growers in Florida and Louisiana.

A wild apple (*Malus doumeri*, No. 54903), sent by Mr. Miéville from the mountains of French Indo China, which, according to Chevalier, was probably cultivated there in ancient times and is now preserved as one of the sacred trees around Laos pagodas, can hardly fail to attract the attention of apple breeders and those who are hunting for the best stock on which to grow our cultivated varieties.

Three strains of the ma-yuen, or adlay (*Coix lacryma-jobi mayuen*, Nos. 54906 to 54908), a soft-shelled variety of Job's tears, which, according to Wester, has decided advantage over upland rice for tropical agriculture, being more drought resistant, a much heavier yielder, and requiring not over half the cost of cultivation, deserve an extensive trial throughout the Tropics. Demonstrations have shown that the adlay can be used in most of the ways in which we use corn.

E. W. Davy sends us from the dense humid forests of tropical Africa *Myrianthus arboreus* (No. 54910), which bears edible fruits 4 inches in diameter that are much appreciated by the natives. It should be tried in those regions in the Tropics inhabited by people with discriminating palates and might prove to be a valuable fruit.

A collection of early-ripening, stiff-stemmed varieties of oats and barley (Nos. 54911 to 54917), sent by Haakon Foss, should prove useful in the regions of the United States having high altitudes.

Dr. E. O. Fenzi has sent from the northern slope of the Cyrenaican plateau of Tripoli seeds of the wild forms of *Cupressus sempervirens* and *Juniperus phoenicea* (Nos. 54918 and 54919) which

may, he thinks, differ from the varieties of these species that have been so long in cultivation.

A collection by Miss Ola Powell of the remarkable pimientos (*Capsicum annuum*) of southeastern Spain, which are so mild that they can be eaten like apples, is represented by Nos. 54959 to 54962. They are grown, dried, ground, and used for their characteristic pimiento flavor and not for their peppery character.

Mr. Rock has suggested *Barringtonia asiatica*, which forms extensive beach forests on the Pacific islands, for use as a beach tree for the sandy keys of Florida; and Doctor Lyon, of Honolulu, has sent in a quantity of the large pyramid-shaped seeds for trial (No. 54963).

The interest in carob culture in southern California makes the introduction by Sr. Liro Oritz of three varieties (*Ceratonia siliqua*, Nos. 54964 to 54966) from Malaga of importance, as we do not yet know which of the superior varieties from the Mediterranean region is going to prove most productive in America.

The botanical determinations of seeds introduced have been made and the botanical nomenclature revised by H. C. Skeels, and the descriptive and botanical notes arranged by G. P. Van Eseltine, who has had general supervision of the work.

David Fairchild,
Agricultural Explorer in Charge.

Office of Foreign Seed and Plant Introduction,
Washington, D. C., January 18, 1923.

INVENTORY.[1]

54677. Stevia rebaudiana Bertoni. Asteraceæ.

From Buenos Aires, Argentina. Seeds presented by D. S. Bullock, Agricultural Commissioner, Bureau of Agricultural Economics. Received January 12, 1922.

"*Ka-á he-é* (sweet herb) is native to Paraguay, growing on the high ground where the yerba maté flourishes. The plant is ordinarily about 20 inches in height with leaves about an inch long. In its wild state the plant is very rare, and no planting of the seeds has ever produced results. It is now believed that the seed is fertile but takes several years to germinate. Propagation is by cuttings. Analyses of the leaves made in Germany show the 'sugar' to be a glucosid in combination with soda and an aromatic resin. It has a sweetening power from 150 to 200 times greater than cane sugar and is soluble in water. It does not ferment and is nontoxic. It is claimed that there is nothing injurious in the leaves and that they can be used for sweetening directly in the natural state, drying and grinding only being required. The aromatic resin gives an additional slight pleasant taste. Since the 'sugar' is soluble, it can be extracted, and it can be used in the liquid form for preserves. It is also claimed that *ka-á he-é* is an ideal and safe sugar for diabetics.

"A German scientist now in Paraguay claims that the plant can be cultivated in fields in a manner similar to alfalfa and cuttings made each year. If the truth of this is demonstrated the plant *ka-á he-é* should be a profitable commercial sugar producer." (*George S. Brady.*)

"George S. Brady, American trade commissioner here, tells me that after being started, the plants can possibly be cut with machinery, as peppermint is cut in Michigan.

"The seeds, I understand, are very small and difficult to grow. It is possible, however, that by treating them as the natives in Paraguay do the maté seed, allowing it to soak in water and wood ashes for 36 or 48 hours, they might germinate." (*Bullock.*)

54678. Echinochloa colonum (L.) Link. Poaceæ. Grass.

From Khartum. Anglo-Egyptian Sudan. Seeds presented by R. E. Massey, Government botanist, Department of Agriculture. Received December 27, 1921. Numbered January, 1922.

Received as *Brachiaria isachne* and sent in response to a request for *Difra* (*Panicum breviradiatum* Hochst.).

54679 and 54680.

From Lavras, Minas Geraes, Brazil. Seeds presented by B. H. Hunnicutt. Received January 14, 1922.

54679. Cymbopogon rufus (Nees) Rendle. Poaceæ. Jaragua grass. (*Andropogon rufus* Kunth.)

A perennial grass native to Brazil and cultivated there and at various other places in the American Tropics. This leafy bunch-grass, the tussocks of which become a foot or so in diameter and the numerous leafy culms 6 to 10 feet high, is primarily a hay grass and yields the best

[1] It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in these inventories are those which the material bore when received by the Office of Foreign Seed and Plant Introduction and, further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in these inventories will in many cases undoubtedly be changed by the specialists interested in the various groups of plants and the forms of the names brought into harmony with recognized American codes of nomenclature.

54679 and 54680—Continued.

quality if cut when 3 feet high, so that from two to six cuttings may be made in a year. The hay is considered excellent for fattening and particularly desirable as horse feed. Previous introductions have been tested in the South and in California with promising results, though the grass is killed at temperatures of about 25° F. In Brazil the grass is also grazed, but it must not be overgrazed, as under such treatment it is killed. At the present time it is being extensively tested in Florida and Texas." (*C. V. Piper.*)

54680. MELINIS MINUTIFLORA Beauv. Poaceæ. **Molasses grass.**

"John Morley, of Lake Alfred, Fla., informed me that the molasses grass (*Melinis minutiflora*) was so successful on his place that he is going to get a large quantity of seed for the planting of a very considerable area of it. He said the trouble experienced by other people who had tried to use this grass was, apparently, that they did not keep it closely enough grazed or cut. When permitted to grow unmolested it is likely to get rank." (*David Fairchild.*)

"I am immensely pleased to learn of the success that Mr. Morley has had in pasturing this plant (*M. minutiflora*). While it grew extremely well at various places in Florida, everyone else has reported that the cattle would not eat it. Apparently they must be educated to it. At Mr. Burguieres's place, West Palm Beach, Fla., the grass behaves as a weed, being abundant everywhere along the fence rows." (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 50162.

54681. DIOSPYROS KAKI L. f. Diospyraceæ. **Kaki.**

From Canton, Kwangtung, China. Seeds presented by C. O. Levine, acting Director of Agriculture, Canton Christian College, through F. A. McClure. Received January 24, 1922.

Kai sam tsz (chicken-heart persimmon).

A variety of kaki from southern China which may be capable of cultivation in southern Florida.

54682. ANNONA sp. Annonaceæ.

From Caracas, Venezuela. Seeds presented by H. Pittier. Received January 27, 1922.

"Seeds of the so-called *chirimoriñon*. The fruit is small for its kind, about 12 centimeters (5 inches) long, ovoid-oblique, and almost pointed at the apex. At the base the scales are very numerous, imbricate, and mostly small; toward the apex they are much larger and scattered in the shape of rounded protuberances. It is by far the most delicious among the sweetsops, the fiberless flesh having just the consistence of thickish cream and a delightful flavor suggestive of strawberry ice cream without any of the 'goût de pommade' of either *Annona reticulata* or *A. cherimola*. The seeds seem to be very few in each fruit." (*Pittier.*)

"Probably tropical in its requirements, and suited for cultivation in the United States only in southern Florida." (*Wilson Popenoe.*)

54683 and 54684. COFFEA spp. Rubiaceæ. **Coffee.**

From Tananarive, Madagascar. Seeds presented by the Nanisans Experiment Station through James J. Carter, American consul. Received January 23, 1922.

"Species of coffee cultivated in the center of the island of Madagascar. Furnished by the Nanisans Experiment Station upon the order of the inspector general of the Agricultural and Forestry Service."

54683. COFFEA ARABICA L.

"*Café vondrona à grains allongés* (long-grain, small-leaf, tufted coffee)."

54683 and 54684—Continued.

54684. COFFEA LIBERICA Bull.

"*Café lava-tanana à gros grains* (large-grain, large-leaf, and long-branch coffee)."

54685. GOSSYPIUM NANKING Meyen. Malvaceæ. **Cotton.**

From Unsan, Pingyang Province, Chosen. Seeds presented by A. Welhaven, Oriental Consolidated Mining Co., through Ransford S. Miller, American consul general, Seoul. Received February 7, 1922.

"This seed was grown in Pukchin Myon, Unsan, northern Pingyang Province (40° 10′ N., 125° 55′ E.), and is supposed to be the best produced locally." (*Welhaven.*)

54686. DIOSCOREA TRIFIDA L. f. Dioscoreaceæ. **Yampi.**

From Gatun, Canal Zone. Tuber presented by A. V. Mitchell, through the Federal Horticultural Board. Received February 13, 1922.

"A pink-skinned, white-fleshed *yampi* of good quality. The tubers are long-oval to club shaped and from 3 to 8 ounces each in weight." (*R. A. Young.*)

For previous introduction, see S. P. I. No. 42053.

54687. MESUA FERREA L. Clusiaceæ.

From Buitenzorg, Java. Seeds presented by Dr. W. M. Docters van Leeuwen, director, Botanic Garden. Received February 3, 1922.

A very handsome, pyramidal tree native to the hot moist regions of Ceylon, India, and the Malay Peninsula. The young leaves which appear twice a year are intense blood red at first, passing through delicate shades of pink into dark green. The large, white, delicately scented flowers are produced profusely in April and May. The kernels yield as much as 70 per cent of very rich, clear, red-brown, somewhat perfumed oil which might be used for confectionery. The oil is used medicinally as a lotion. The dark-red wood is extremely hard and heavy and when well seasoned is used for beams, masts, tool handles, in bridge construction, etc. Railway ties made of this wood were not attacked by white ants and were quite sound after four years of use. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting, p. 260,* and *Pearson, Commercial Guide to the Forest Economic Products of India, p. 68.*)

54688. GOSSYPIUM BARBADENSE L. Malvaceæ. **Cotton.**

From Cairo, Egypt. Seeds presented by James A. Prescott, Sultanic Agricultural Society. Received January 19, 1922.

Pilion.

Introduced for department specialists engaged in cotton breeding.

54689. OPUNTIA FICUS-INDICA (L.) Mill. Cactaceæ. **Indian fig.**

From Valetta, Malta. Cuttings presented by Società Economica Agraria, through Cary Loop, American consul. Received February 3, 1922.

These cuttings were received in response to a request for propagating material of a nearly spineless variety introduced from Malta in 1903 (under S. P. I. No. 9352) and said to bear yellowish orange fruits the size of a goose egg, of good flavor, and containing less than a dozen seeds.

For previous introduction, see S. P. I. No. 9352.

54690. MANGIFERA INDICA L. Anacardiaceæ. **Mango.**

From Honolulu, Hawaii. Plants presented by J. M. Westgate, agronomist in charge, Agricultural Experiment Station. Received January 17, 1922.

"*Victoria.* The original tree, Victoria No. 9, is a seedling growing on the residence property of Thomas G. Thrum, 1508 Thurston Avenue, Honolulu. During the eighties a number of mango seeds were brought from the West Indies

by Joseph Marsden, a Government official of Hawaii. Among the seedlings developed from the introduced seeds was one known as No. 9. In 1897 a seed of this No. 9 was given to Mr. and Mrs. George Ashley, who then lived at 1508 Thurston Avenue. Mrs. Ashley germinated this seed, setting it in the front yard in its present location on June 20, 1897, the date of the Diamond Jubilee of Queen Victoria of England. For this reason the tree was called 'Victoria No. 9.' When it fruited it was discovered that the fruit was different from any of the mangos growing in Hawaii, particularly in color. Its qualities are superior to any of those mangos formerly brought to Hawaii by Mr. Marsden.

"The tree has proved to be very prolific, often producing as many as three distinct crops per year. The fruits are but little clustered, generally hanging singly on individual stems. From the time the fruits set they are red, becoming more brilliant on ripening. Like some other mangos, the Victoria No. 9 reproduces its quality of fruit fairly accurately on seedling trees. There are a number of seedlings in various parts of the islands which are reported as being fairly true in fruit production to the parent tree. The variety may be perpetuated without question by grafting.

"Description of the fruit: Size medium; weight about 9 ounces; shape oblong, slightly -shaped and necked somewhat at stem end; apex broadly rounded with curve ending in a small blunt beak which sometimes contains a small holelike depression; color when ripe brilliant vermilion shaded over yellow ground color; yellow ground color most evident at apex. Surface marked with small yellow dots which become overcast where red is deepest. Shoulder of fruit has delicate powdery bloom. Skin is of medium thickness, tough so as to peel well. Odor a pleasing fragrance. Ripe flesh of deep rich yellow color, good texture; juice sweet acid and of flavor of the Pirie mango. Seed small, weight three-fourths of an ounce. Marketing qualities ranking among best varieties in Hawaii." (*Willis T. Pope.*)

54691. Flacourtia euphlebia Merr. Flacourtiaceæ.

From Manila, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Bureau of Agriculture, through Sr. Adn. Hernandez, Secretary of Agriculture and Natural Resources. Received January 27, 1922.

"*Lanagon.* A small tree, native to these islands, bearing in profusion fruits very similar in appearance and flavor to those of *Flacourtia cataphracta.* They can probably also be used in the same way as those of the latter, i. e., for jelly making." (*Wester.*)

54692 to 54698.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received January 31, 1922.

54692. Bucklandia populnea R. Br. Hamamelidaceæ.

One of the most beautiful of the forest trees of the Sikkim Himalayas at altitudes of 4,000 to 6,000 feet. The glossy green leathery leaves are red veined and red petioled. The young leaves are more or less deep blood red, unspotted beneath, but shot with green above. The remarkable long red stipules resemble those of Liriodendron. (Adapted from *Curtis's Botanical Magazine, pl. 6507.*)

54693. Bupleurum fruticosum L. Apiaceæ.

"An evergreen, quite hardy shrub." (*Proschowsky.*)

This ornamental European shrub is interesting because of its densely leafy branches and continuous bloom. The persistent leathery leaves resemble those of some of the shrubby Hypericums in appearance and arrangement. The ends of the branches are tipped with broad umbels of yellow flowers that are in bloom more or less continuously from late April to September. In southern Europe, Syria, and northern Africa this plant is found growing wild in sterile soil on dry hills. (Adapted from *Bonnier, Flore Complète de France, Suisse, et Belgique, vol. 4, p. 13.*)

For previous introduction, see S. P. I. No. 27189.

54692 to 54698—Continued.

54694. PISTACIA LENTISCUS L. Anacardiaceæ.

"This shrub is common in southern Europe, forming most of the Mediterranean 'maquis.' It produces a gum used by the Arabs as a perfume. It is always a shrub in the wild state, but I have seen a garden specimen which formed a very beautiful tree 7 to 8 meters (23 to 26 feet) in height, with a large, dense, rounded crown of beautiful evergreen foliage. The plant will grow in the worst soil and stands any amount of drought." (*Proschowsky.*)

An edible oil, known as shinia oil (used as a substitute for olive oil), is obtained from the berries. As prepared by the usual primitive methods the oil does not retain its sweetness for longer than three months after its extraction. The yield is said to be very satisfactory, being about 18 per cent. (Adapted from *Cyprus Agricultural Journal, vol. 13, pt. 1, p. 28.*)

For previous introduction, see S. P. I. No. 51698.

54695. SOLANUM PIERREANUM Paill. and Bois. Solanaceæ.

"A species with beautiful, large, fire-red, long-lasting fruits." (*Proschowsky.*)

Olombé. The Pahouins, of Gabon Colony, French Equatorial Africa, eat the brilliant-red fruits which are the size of a small walnut and are borne singly or in pairs. The plant is a good ornamental for southern climates. (Adapted from *Bulletin de la Société d'Acclimatation de France, vol. 37, p. 483,* and from *Revue Horticole, vol. 62, p. 343.*)

54696. SOLLYA HETEROPHYLLA Lindl. Pittosporaceæ.

"A beautiful blue-flowered climber." (*Proschowsky.*)

This handsome Australian climbing shrub somewhat resembles bittersweet (*Solanum dulcamara*) in habit, but much surpasses that plant in its larger and more beautiful lilac or purple bell-shaped blossoms in few-flowered clusters, which cover the plant with a profusion of bloom in June and July. The red calyxes and pedicels and the persistent dark-green lanceolate leaves form a charming contrast with the flowers. Propagation is by cuttings, layering, and seeds, the last being very numerous in the long spindle-shaped pods. (Adapted from *Revue d'Horticulture Belge et Étrangère, vol. 21, p. 253.*)

54697. THRYALLIS BRASILIENSIS L. Malpighiaceæ.
(*Galphimia brasiliensis* Juss.)

An ornamental Brazilian shrub, 12 to 18 inches in height, with opposite leaves and terminal racemes of small yellow flowers. The plant bears a superficial resemblance to some of the small Hypericums. The species of Thryallis are cultivated to some extent in Europe, but are little known in America.

54698. ZANTHOXYLUM ALATUM PLANISPINUM (Sieb. and Zucc.) Rehd. and Wils. Rutaceæ.

A Japanese shrub 7 to 13 feet high, much branched at the base, sometimes with a short trunk. The dark-brown spreading branches, drooping a little at the tips, bear stout, straight spines in pairs and evergreen pinnate leaves dark green above and paler beneath. The small red fleshy fruits are persistent and emit a very agreeable aromatic odor when bruised. The shrub should be more extensively planted as an ornamental; in addition it makes a very formidable hedge. Propagation is by seeds or cuttings. (Adapted from *Revue Horticole, vol. 85, p. 17.*)

54699. CITRUS SINENSIS (L.) Osbeck. Rutaceæ. Orange.

From Paramaribo, Dutch Guiana. Budwood presented by W. L. Kann, Pittsburgh, Pa. Received February 7, 1922.

"Budwood of a very good orange from the Fernandez estate, La Liberté. According to Mr. Kann, one tree bore 700 fruits. The trees are now 7 or 8 years old and have borne for four or five years. The fruit ripens in July and August." (*David Fairchild.*)

54700. CUCURBITA FICIFOLIA Bouche. Cucurbitaceæ. **Chilacayote.**

From San Jacinto, Distrito Federal, Mexico. Seeds presented by Sr. A. Brambila, Department of Agriculture. Received February 14, 1922.

"The *chilacayote*, often called *chiberre* in Costa Rica, is cultivated in various parts of Mexico and Central America, where it is also native. The stems spread to a considerable distance (20 feet or more) from the main plant, the leaves are roundish kidney shaped, and the flowers are pale yellow. The fruits resemble in a general way small watermelons; the white flesh is edible only after cooking and is used for conserves and pies." (*P. G. Russell.*)

For previous introduction, see S. P. I. No. 42970.

54701. RUBUS MACROCARPUS Benth. Rosaceæ. **Colombian berry.**

From Bogota, Colombia. Seeds presented by E. O. Wolcott. Received February 15, 1922.

For description and previous introduction, see S. P. I. No. 51706. Also see article by Wilson Popenoe in the Journal of Heredity, vol. 11, pp. 194 to 202.

54702. EUGENIA KLOTZSCHIANA Berg. Myrtaceæ. **Pera de campo.**

From Lavras, Minas Geraes, Brazil. Seeds presented by Benjamin H. Hunnicutt, director, Instituto Evangelico, Escola Agricola de Lavras. Received February 7, 1922.

For description and previous introduction, see S. P. I. No. 37492; for further description see Dorsett, Shamel, and Popenoe, The Navel Orange of Bahia; with Notes on Some Little-Known Brazilian Fruits (U. S. Department of Agriculture Bulletin No. 445, p. 32.)

54703. ALEURITES MONTANA (Lour.) Wilson. Euphorbiaceæ. **Mu-oil tree.**

From Hongkong, China. Seeds presented by H. Green, superintendent. Botanical and Forestry Department. Received February 28, 1922.

"This is the *mu-yu-shu* (literally, wood-oil tree), of southern China. It is less hardy than the tung-oil tree, *Aleurites fordii*, and 2-year-old specimens growing at Tallahassee, Fla., were killed by cold in February, 1917. The oil is practically identical with tung oil. The fruit and leaves are different in appearance from those of *A. fordii*." (*R. A. Young.*)

For previous introduction, see S. P. I. No. 50353.

54704. VOANDZEIA SUBTERRANEA (L.) Thouars. Fabaceæ.

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received February 15, 1922.

Obtained originally from the colony of Senegal, French West Africa.

For description and previous introduction, see S. P. I. No. 49881.

54705. CASUARINA SUMATRANA Jungh. Casuarinaceæ.

From Singapore, Straits Settlements. Seeds presented by I. Henry Burkill, director, Botanic Gardens, through Dr. P. J. S. Cramer, chief, Plant-Breeding Station, Buitenzorg. Received February 18, 1922.

"The most beautiful of the Casuarinas and one of the most decorative of tropical trees. It has a thick pyramidal habit and is a beautiful shade of green." (*Cramer.*)

For previous introduction and description, see S. P. I. No. 37119.

54706. CASSIA GRANDIS L. f. Cæsalpiniaceæ.

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, in charge, Department of Botany and Forestry, Experiment Station of the Hawaiian Sugar-Planters' Association. Received February 15, 1922.

The South American *pink shower*, an exceedingly handsome tree 50 feet or more in height, which is cultivated in many tropical countries for its beautiful blooms. The abundant racemes of deep-pink flowers, an inch across, are produced in February and March, during which time the tree is deciduous, or partly so. The pinnate leaves and young branches are covered with fine, soft, copper-colored hair. (Adapted from *Rock, The Ornamental Trees of Hawaii, p. 104.*)

For previous introduction, see S. P. I. No. 52401.

54707 and 54708. TRIFOLIUM PRATENSE L. Fabaceæ. Red clover.

From Helsingfors, Finland. Seeds purchased by Leslie A. Davis, American consul. Received February 21, 1922.

54707. *Punga-apila*, from Suomi. From Keskusosuusliike Hankkija, r. l.

54708. *Sydfinskt*, from Centralandelslaget Labor m. b. t.

54709 to 54725. PRUNUS MUME Sieb. and Zucc. Amygdalaceæ. Japanese apricot.

From Okitsu, Shizuokaken, Japan. Budwood presented by Prof. T. Onda, Bureau of Horticulture, Imperial Agricultural Experiment Station. Received February 24, 1922. Quoted notes by Professor Onda.

The "mume," or Japanese apricot, is found throughout the Japanese Empire, where it is both wild and cultivated. In height it ranges from 10 to 25 feet, reaching its maximum development in the northern parts of its native country. Before the leaves appear in the spring the tree is covered with a profusion of attractive blossoms which are white in the wild forms, while in the cultivated varieties the color varies from white to pink, with occasional tinges of green or yellow. The most desirable varieties are those with double flowers and dwarf habit; the latter characteristic is of much importance among the Japanese because of their well-known liking for dwarf trees.

In favorable seasons the "mume" blooms at the beginning of February, and one may see the altars and homes decorated with flowering branches as a symbol of approaching spring. Pilgrimages are made to certain trees which are considered sacred because of associations with divine princes or national heroes, and cuttings from these trees accordingly assume great value in all parts of the land. The tree also plays an important rôle in Japanese literature.

The fruits ripen in June; they are exceedingly sour and are eaten only in the form of pickles. These are consumed in large quantities in Japan, being prepared with the leaves of a mint, *Perilla arguta*, which gives them a reddish color and an aromatic taste. (Adapted from *Revue Horticole, vol. 57, p. 564*, and *note under S. P. I. Nos. 9211 to 9216.*)

"The 15 'mume' trees at my home in Maryland are among the most admired plants which I have. Since this species is early flowering and perfectly hardy, it should have a great future in this country. If we can propagate it as we are now propagating the Japanese flowering cherries, I believe we can make it quite as popular in America as the latter have become. The fact that the 'mume' blossoms earlier than the cherry, that the tree does not grow quite so large, and that the flowers are fragrant, adapts it particularly for planting in dooryards." (*David Fairchild.*)

54709. "*Beni Kaga.* An early-flowering variety with medium-sized white flowers followed by medium-sized fruits."

54710. "*Beni Sashi.* An early-flowering variety with small white flowers and small red fruits."

54711. "*Bungo.* A late-flowering variety with large light-red flowers and large fruits."

For previous introduction, see S. P. I. No. 45878.

54712. "*Hanakami.* A midseason variety with rather small light-red flowers and medium-sized light-brown fruits."

For previous introduction, see S. P. I. No. 45879.

54709 to 54725—Continued.

54713. "*Inkyo.* An early-flowering variety with medium-sized white flowers and large fruits."

54714. "*Joshu.* A midseason variety, with small, light-red, double flowers and large fruits."

54715. "*Kichirobei.* A midseason variety with medium-sized white flowers followed by large fruits."

53716. "*Ko mume.* A midseason variety with rather small white flowers and very small fruits."

For previous introduction, see S. P. I. No. 45881.

54717. "*Koshu.* A rather late-flowering variety producing small white flowers and very small fruits."

54718. "*Masui.* A late-flowering variety with rather small white flowers; the fruits are large."

54719. "*Rinshu.* A double-flowered variety, with medium-sized, light-red flowers produced late in the season. The fruits are large."

For previous introduction, see S. P. I. No. 45876.

54720 and 54721. "*Shidare.*"

54720. "A red-flowered form with drooping branches and rather small light-red flowers produced late in the season."

54721. "A white-flowered midseason form with drooping branches, rather small flowers, and small fruits."

54722. "*Shira Kaga.* A variety with medium-sized, clear-white flowers produced rather late in the season. The fruits are large."

For previous introduction, see S. P. I. No. 45880.

54723. "*Tama mume.* A midseason variety producing medium-sized white flowers with green calyxes. The rather large fruits are clear green."

54724. "*Unryu.* An early-flowering double variety suitable as an ornamental pot plant. The very crooked branches bear medium-sized white flowers."

54725. "*Yoro.* A rather late-flowering variety producing rather small light-red flowers and medium-sized fruits."

For previous introduction, see S. P. I. No. 45877.

54726. Hydnocarpus anthelminthica Pierre. Flacourtiaceæ. Maikrabao.

From Chiengmai, Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received February 25, 1922.

"(December 29, 1921.) This is a large tree about 50 to 80 feet in height, found along stream beds north of Chiengmai in northern Siam, and is apparently a new variety. It differs from the southern Siamese form in the fruit, which is chestnut brown and neither velvety nor strongly lenticellate. The staminate flowers are on long pedicels and have no rudimentary ovary, but the pistillate flowers, which are on shorter pedicels and occur in the axils of young (this year's) shoots, have five short sterile anthers. The fruits are from 11 to 12 inches in circumference and contain from 20 to 35 seeds. They ripen in November, but fruits may be found on the trees all the year round." (*Rock.*)

This tree yields an oil similar to that of *Taraktogenos kurzii;* the latter is, however, the source of the true chaulmoogra oil.

54727. Ampelocissus imperialis (Miquel) Planch. Vitaceæ.

(*Vitis imperialis* Miquel.)

From Buitenzorg, Java. Seeds presented by Dr. W. M. Docters van Leeuwen, director, Botanic Gardens. Received February 18, 1922.

"The small spherical 2-seeded berries are sour, but good for jelly; however, the yield is so small that the plant has no cultural interest as a fruiting vine." (*G. C. Husmann.*)

An ornamental vine from tropical and subtropical Asia, with thick heart-shaped leaves resembling those of a begonia, and long-stalked clusters of deep-violet flowers.

54728. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Naples, Italy. Seeds purchased from the Agenzia Agraria, Nappi & Mascia, of Naples, through Homer M. Byington, American consul. Received February 20, 1922.

Medium red-clover seed known as *double cut* or *early clover*, introduced for growing in comparison with American-grown seed.

For previous introduction, see S. P. I. No. 54708.

54729 to 54731. MEDICAGO SATIVA L. Fabaceæ. **Alfalfa.**

From Valence, France. Seeds presented by Téziér Frères. Received February 18, 1922. Quoted notes by Téziér Frères.

"Alfalfas from the principal producing districts of France. These strains are all more or less similar, but the difference in climate of the sections in which they are grown has slightly altered their characters, and some are a little more hardy than the others."

54729. "*Alps.* We consider the *Alps* strain, which is grown in the mountains, especially noteworthy."

54730. "*Poitou.*"

54731. "*Provence.*"

54732 to 54734.

From Okitsu, Shizuokaken, Japan. Seeds presented by Prof. T. Onda, Bureau of Horticulture, Imperial Agricultural Experiment Station. Received February 24, 1922.

Introduced for experiments by department specialists.

54732. AMARANTHUS CAUDATUS L. Amaranthaceæ. **Love-lies-bleeding.**

Himogeito.

54733. AMARANTHUS GANGETICUS MELANCHOLICUS (L.) Voss. Amaranthaceæ. **Joseph's-coat.**

Hageito.

54734. KOCHIA SCOPARIA (L.) Schrad. Chenopodiaceæ. **Belvedere.**

Hahakigusa.

54735. ROSA GENTILIANA Lev. and Van. Rosaceæ. **Rose.**

From Witcombe, Gloucester, England. Seeds presented by Lady Harriet Thiselton-Dyer. Received March 1, 1922.

A vigorous bush rose from western China, which makes tangled bunches 12 to 15 feet high and 15 to 20 feet in diameter. The 5-foliolate leaves are dark glossy green; the pure-white single flowers, about an inch in diameter and delightfully fragrant, are borne in broad clusters and unless damaged by storms will continue to bloom for nearly two months. The bush should be given an isolated position where it can be left to develop; it should not be pruned. (Adapted from *The Garden Magazine, vol. 23, p. 339.*)

Received as *Rosa ecrasocarpa*, which is now referred to *R. gentiliana.*

For previous introduction, see S. P. I. No. 47359.

54736 and 54737.

From Hobart, Tasmania. Seeds collected by Victor O. Fletcher, Newnham, near Launceston, and presented by L. A. Evans, Acting Director of Agriculture. Received March 9, 1922.

54736. DANTHONIA SETACEA R. Br. Poaceæ. **Wallaby grass.**

"A good native grass." (*Evans.*)

A valuable perennial pasture grass frequently less than a foot high, common in many localities in Australia and New Zealand. The soft narrow leaves are mostly short and erect and either smooth or somewhat pubescent with spreading hairs. In the spring the dense, narrow, branching panicles glisten with white-haired flowering glumes.

The species of Danthonia are probably the most important economic grasses of New South Wales. In New Zealand they are recommended only for the poorer soils of the South Island; but in the North Island they are considered very valuable pasture grasses and are credited with carrying two sheep to the acre. In New South Wales the Danthonia grasses are commonest on the table-lands and slopes, where they constitute about 90 per cent of the dominant grasses in well-managed pasture, sometimes, indeed, monopolizing the whole situation. In coastal districts they are common in newly cleared areas, in scrub lands, and very often in well-worked fallowed fields. In the western districts they are just a little less abundant than on the slopes and table-lands. The Danthonia grasses can therefore be termed the commonest and most widely distributed grasses of New South Wales, and without them our pastoral industry would suffer considerably.

The danthonias are tussocky in habit, but they stool considerably and will stand a great amount of grazing. Some of the species are rather hairy, particularly those of the western plains, but evidently this is no drawback as far as palatability is concerned. During the hot summer months the grass dies off considerably, but can be revived in a wonderful manner by rain.

The value of the Danthonia grasses in respect to palatability, both for cattle and sheep, has been well proved by every stockman. The forms that grow abundantly in the coastal districts (*Danthonia longifolia* and *D. racemosa* types) fatten horses and dairy stock very quickly; while on the table-lands and slopes and in the interior some of the best sheep in New South Wales are raised on Danthonia grasses alone. Even when other grasses are completely dried up, the danthonias will produce a fair amount of greenness in the bottom growth, and it is due to such feed that the Riverina can carry excellent sheep during a dry spring and summer. (Adapted from *Bentham, Flora Australiensis, vol. 7, p. 595,* and *Agricultural Gazette of New South Wales, vol. 31, p. 24.*)

For previous introduction, see S. P. I. No. 53115.

54737. THEMEDA AUSTRALIS (R. Br.) Stapf. Poaceæ. **Kangaroo grass.**

"*Kangaroo* grass is common in many places in Australia and grows to a great height when left unmolested for a time. A peculiarity of this grass, and one which seriously hinders its multiplication, is the fact that it bears in its large ornamental flower heads very few fertile seeds. If the farmer would only recognize this and remove his stock during spring and summer from the fields in which kangaroo grass has a hold, a valuable fodder grass would be conserved; otherwise, there is a serious danger of its being eaten out. The proof of this assertion can be seen by observing the rich growth of kangaroo grass within many railway inclosures, while without not a blade is to be seen. One would infer from its height (it sometimes grows tall enough to hide sheep) and consequent coarseness that it would not be favored by stock, but they are extremely partial to it." (*Journal of the Department of Agriculture of Victoria, vol. 15, p. 713,* under *Anthisteria imberbis.*)

54738. ALEURITES FORDII Hemsl. Euphorbiaceæ. **Tung-oil tree.**

From Pineville, La. Seeds presented by Albert R. Arey, superintendent, Alexandria National Cemetery. Received February 27, 1922.

Seeds of the tung-oil tree, grown at Pineville, La., and numbered for convenience in distribution.

For previous introduction, see S. P. I. No. 50635.

54739. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Copenhagen, Denmark. Seeds presented by H. N. Knudsen, Secretary, Danish Royal Agricultural Society. Received March 6, 1922.

Tystofte No. 40 originated in a 2-year plat of *Rosendal* clover. Seed of this variety was sown in 1900, and the clover was thus subjected to the hard winter of 1901. In 1902 the strongest plants from this test were selected, one of which was *No. 40*. Later this strain was compared with others in several tests. In three of our tests, all the clovers made vigorous growth during the first year, and in this respect *No. 40* averaged well above the others. In all four tests *No. 40* gave the largest crop, fully 20 per cent better than that of the next best. These results agree well with the results of earlier tests at Lyngby and Tystofte in which this strain decidedly surpassed all others. (Adapted from *Beretning fra Statens Forsögsvirksomhed i Plantekultur, No. 95, p. 401.*)

54740. ROSA GENTILIANA Lev. and Van. Rosaceæ. **Rose.**

From Witcombe, Gloucester, England. Cuttings presented by Lady Harriet Thiselton-Dyer. Received March 1, 1922.

Received as *Rosa cerasocarpa*, which is now referred to *R. gentiliana*.

For previous introduction, see S. P. I. No. 54735.

54741. DIOSPYROS KAKI L. f. Diospyraceæ. **Kaki.**

From Summerville, S. C. Scion presented by John B. Gadsden. Received March 2, 1922.

"The finest variety of persimmon I have ever seen. The fruit is conical, deep orange, with a small smudge of black near the point, seedless, of excellent flavor, and ripening about December 1. Our specimens weigh from 14 to 17 ounces." (*Gadsden.*)

54742 to 54747.

From Chefoo, Shantung, China. Seeds presented by A. Sugden. Received February 27, 1922. Quoted notes by Mr. Sugden.

54742. HORDEUM VULGARE COELESTE L. Poaceæ. **Barley.**

"Winter-sown barley used in the manufacture of straw braid. Grown 200 to 300 miles west of Chefoo."

54743 and 54744. ORYZA SATIVA L. Poaceæ. **Rice.**

54743. "Winter-sown glutinous rice grown at Wenteng, 60 miles from Chefoo."

54744. "Winter-sown glutinous rice grown at Chefoo."

54745 to 54747. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.**
(*T. vulgare* Vill.)

54745. "Wheat grown 200 to 300 miles west of Chefoo, used in the manufacture of straw braid."

54746. "Wheat from the far western part of the Province of Shantung."

54747. "Winter-sown local wheat which makes good flour."

54748 to 54760.

From Harbin, Manchuria. Seeds purchased by B. W. Skvortzow. Received February 28, 1922. Quoted notes by Mr. Skvortzow.

Introduced for experimental work by specialists of the Department of Agriculture.

54748 to 54760—Continued.

54748. ABUTILON THEOPHRASTI Medic. Malvaceæ.
(*A. avicennae* Gaertn.)

"Manchurian jute."

For previous introduction, see S. P. I. No. 39361.

54749 and 54750. ECHINOCHLOA CRUSGALLI EDULIS Hitchc. Poaceæ. **Barnyard millet.**

54749. A large-seeded variety.

54750. A small-seeded variety.

For previous introduction, see S. P. I. No. 54440.

54751. MEDICAGO FALCATA L. Fabaceæ.

"Found growing wild."

For previous introduction, see S. P. I. No. 42018.

54752 to 54755. PANICUM MILIACEUM L. Poaceæ. **Proso.**

54752. Straw-colored variety.

54753. White variety.

54754. Light-brown variety.

54755. Dark-brown variety.

For previous introduction, see S. P. I. No. 48724.

54756. PRUNUS SALICINA Lindl. Amygdalaceæ. **Japanese plum.**

"Cultivated by Chinese."

This is a strong-growing small tree, native to China but cultivated in Japan, with showy white flowers and rather pointed fruits which are usually yellow or light red. Because of its great hardiness, vigor, and fruiting qualities, it is introduced for experimental work by specialists of the Department of Agriculture.

For previous introduction, see S. P. I. No. 41257.

54757. PRUNUS TOMENTOSA Thunb. Amygdalaceæ. **Bush cherry.**

"Cultivated by Chinese."

"A very vigorous bush cherry which flowers much earlier than other cherries and bears when very young. Selected seedlings 3 to 4 years old have borne 15 to 20 quarts of fruits which make very fine jelly. In regard to the hardiness of this species, it may be stated that trees have successfully withstood seven winters in North Dakota. The tree is somewhat susceptible to brown-rot on the twigs." (*George M. Darrow.*)

For previous introduction, see S. P. I. No. 46534.

54758 and 54759. VITIS AMURENSIS Rupr. Vitaceæ. **Amur grape.**

Apparently two wild forms of the Amur grape.

54758. No. 1. 54759. No. 2.

For previous introduction, see S. P. I. No. 36753.

54760. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

For previous introduction, see S. P. I. No. 48793.

54761. ZIZANIA LATIFOLIA (Griseb.) Stapf. Poaceæ. **Wild rice.**

From Kew, Surrey, England. Roots presented by Sir David Prain, director, Royal Botanic Garden. Received February 23, 1922.

Introduced for special experimental work in connection with *Zizania aquatica.*

For previous introduction, see S. P. I. No. 44069.

54762 to 54766. PANICUM MILIACEUM L. Poaceæ. **Proso.**

From district of Iwate, Japan. Seeds presented by Prof. Takeo Kusano, Kagoshima Imperial College of Agriculture and Forestry, Kagoshima, Japan. Received March 8, 1922. Quoted notes by Professor Kusano.

54762. Mixture of four varieties of millet.

54763. "*Hoten-kuro-kibi.* Black millet originally from Mukden, Manchuria."

54764. "*Ki-kibi.* Yellow millet."

54765. "*Shiro-kibi.* White millet."

54766. "*Zairai-kuro-kibi.* Black millet, much used for planting in this district."

54767. PHOENIX OUSELEYANA Griffith. Phœnicaceæ. **Palm.**

From Calcutta, India. Seeds presented by Percy Lancaster, secretary, Agricultural and Horticultural Society of India. Received March 7, 1922.

An armed palm with a short stem up to 12 feet in height and 9 inches in diameter, densely covered with the stumps of leafstalks. The edible fruits are orange colored until fully ripe, when they become black. The pinnate leaves are 4 to 8 feet long with pliable clustered leaflets more or less four ranked. Native to the southern slopes of the Himalayas and to the East Indies. (Adapted from *Brandis, Indian Trees, p. 645.*)

54768. EUGEISSONA TRISTE Griffith. Phœnicaceæ. **Palm.**

From Buitenzorg, Java. Seeds presented by Dr. W. M. Docters van Leeuwen, director, Botanic Garden. Received March 10, 1922.

A stemless, tufted palm common in the hill forests of Malakka. The numerous spreading leaves, 15 to 20 feet long, are occasionally used for thatching and for making mats; the long petioles are armed with brown ascending spines. The terminal panicle, 4 to 6 feet long, is furnished below with much-armed sheaths, and even the long-pointed, often whiplike spathes are armed. The densely scaly, ovate fruits are generally rough with the recurved edges of the dark-brown scales. Malayan name, *bertam.* (Adapted from *Calcutta Journal of Natural History, vol. 5, p. 10.*)

54769. UAPACA KIRKIANA Muell. Arg. Euphorbiaceæ.

From Mount Silinda, Southern Rhodesia, Africa. Seeds presented by Dr. W. L. Thompson, Africa Inland Mission. Received January 4, 1922.

"*Majanji,* an indigenous fruit of great value to our natives here which perhaps saves many lives in famine times. It is of delicious flavor and very healthful, so far as I am aware. The great drawback to its use by Europeans is that the seeds occupy so large a part of the bulk of the fruit. Still we often enjoy eating them. The trees grow about 20 feet high, often on rocky hillsides not well adapted to cultivation. The fruit of each tree has its own peculiarities of shape and size, as well as in size of seeds as compared with size of fruit, etc. If they could be improved to make the fruit larger and seeds smaller, I think they would be quite attractive." (*Thompson.*)

54770 to 54775. RIBES VULGARE Lam. Grossulariaceæ. **Garden currant.**

From Barnham, England. Plants purchased from The Barnham Nurseries, Ltd. Received January 5, 1922.

54770. *Comet* (red). Said to be a very fine new variety, of large size, robust habit, and an immense cropper; not so acid as some of the older sorts.

54771. *New Red Dutch.* Said to be a most reliable sort, spreading habit, very fine bearing; late.

For previous introduction, see S. P. I. No. 41988.

54770 to 54775—Continued.

54772. *Perfection* (Laxton, new). Reported as a remarkably fine red variety of exceptionally vigorous growth; a very heavy cropper, with long bunches of large berries.

54773. *Raby Castle* (May's Victoria, or Cherry). Reported to be a large-fruited strong grower.

For previous introduction, see S. P. I. No. 42245.

54774. *Red Dutch.* Said to be the variety usually grown.

For previous introduction, see S. P. I. No. 42240.

54775. *Red Grape.* Reported a very fine berry and heavy cropper.

For previous introduction, see S. P. I. No. 42244.

54776. Guilielma utilis Oerst. Phœnicaceæ. Pejibaye.

(*Bactris utilis* Benth. and Hook.)

From San Jose, Costa Rica. Seeds purchased through Sr. Otón Jimenez. Received January 3, 1922.

"In Costa Rica the pejibaye has been cultivated by the Indians since remote antiquity. In the lowlands of Colombia, Venezuela, and Ecuador it forms a staple foodstuff of numerous aboriginal tribes. The Jíbara Indians of Ecuador hold the fruit in such esteem that the ripening season is celebrated annually by a feast of several days' duration.

"This palm is pinnate leaved and reaches a maximum height of about 60 feet. Its straight, slender stem, commonly about 6 inches thick, is armed from the ground upward with stiff, very sharp black spines about 2 inches long. The leaves, which are graceful in appearance, especially when the plant is young, are commonly 8 to 12 feet in length and deep green.

"The species is monœcious, the staminate and pistillate flowers being produced upon the same raceme; the latter occur scattered among the former, and both are small, sessile, and yellow-white. The racemes, which are produced from the trunk of the palm immediately below or among the lower leaves and are protected by erect spathes, are stout and 18 to 24 inches long.

"The flowers usually appear during April, May, and June in the lowlands of Costa Rica, somewhat later in the highlands. The first fruits mature in September; and from this month until March or April there are usually ripe fruits on the plant, provided the racemes are not cut when the first fruits reach maturity. The long time which the fruits will remain on the palm in good condition is a noteworthy feature of the pejibaye.

"Racemes of mature fruits sometimes weigh 25 pounds or more, and five or six such racemes are often produced by the palm in a single crop. The maximum production of one palm (or, more properly speaking, one stem, since four or five stems are often allowed to grow from a common base) is about 150 pounds of fruit. It is seen, therefore, that the productiveness of the pejibaye is similar to that of the date palm.

"The individual fruits are top-shaped, conical, or ovoid, and vary from 1 to 2 inches in length. There is a wide range of variation in color, some varieties being clear light yellow, while others are deep orange or reddish orange, sometimes shading to brown. The flesh is dry and mealy, yet firm, and pale orange to yellow. The single seed is conical, about three-quarters of an inch long.

"The relatively small proportion of water contained in the fruit, the large amount of carbohydrates (mainly starch), the considerable quantity of fat, and the small size of the seed compared to the bulk of the edible portion combine to place the pejibaye among the most noteworthy of the tropical fruits. And it is not only a fruit of high food value, but it is delicious as well. We believe that it is destined to become a food plant of great importance in many tropical countries.

"Like the chestnut, which the boiled fruit strikingly resembles in texture and flavor, the pejibaye is used as a stuffing for turkey and chicken. Dried, it might be reduced to a flour which would serve various culinary uses. But to one who has eaten the freshly boiled pejibaye there is no incentive for seeking new ways of preparing the fruit for the table.

"The pejibaye is a plant adapted to tropical conditions, preferring a region where the rainfall is not excessive (75 inches annually or less). It is more adaptable than the breadfruit tree. The latter rarely succeeds in the Tropics

at altitudes greater than 2,500 feet, while the pejibaye fruits successfully in Costa Rica at all altitudes from sea level to 4,000 feet, though it is said not to bear well in the cool climate of the latter altitudes.

"It is doubtful if the species will grow successfully in a cool subtropical climate, such as that of southern California. In extreme southern Florida, however, there are probably regions where it will succeed.

"In Cuba, Porto Rico, and the other West Indian islands it should find itself entirely at home, and we recommend it for cultivation in these islands. In many parts of Brazil it should also succeed, while the Asiatic Tropics undoubtedly offer immense regions where it could be cultivated to great advantage.

"When grown from seed the pejibaye comes into bearing at an age of 6 to 8 years, and its life is considered to be 50 to 75 years or perhaps more.

"In commercial plantings pejibayes should be spaced 20 feet apart. Carlos Werckle considers that the best system is to allow two or four suckers to develop around the base of each palm, thus forming a clump of three to five stems. Suckers invariably develop after the palm has attained a few years' growth. Some of them may be removed to extend the plantation. The finest varieties are seedless and must therefore be propagated by vegetative means." (*Wilson Popenoe* and *Otón Jimenez.*)

For a more thorough discussion of this palm, see the Journal of Heredity, vol. 12, pp. 154 to 166, April, 1921.

For illustrations of this palm and its fruit, see Plates I and II.

54777. EUGENIA DOMBEYI (Spreng.) Skeels. Myrtaceæ.
(*E. brasiliensis* Lam.) **Grumichama.**

From Port Louis, Mauritius. Seeds presented by G. Regnard. Received January 16, 1922.

"A very fine shrub, 10 to 15 feet high, with large glazed leaves and white blossoms. Fruit similar to the cherry, red, becoming black when fully ripe, with sweet, soft flesh." (*Regnard.*)

A shapely, attractive tree, the size of an orange tree, with elliptic, glossy, deep-green leaves 2 to 3 inches long. The small white flowers are followed in a month by mature fruits which are pendent, deep crimson, and the size of a cherry, with persistent green sepals. The skin is thin and delicate, and the soft melting flesh, mildly subacid like that of the Bigarreau cherry, is usually eaten fresh but may also be used to make jam or preserves. Seedlings bear when 4 or 5 years old, and the tree withstands 26° F. without injury. (Adapted from *Popenoe, Manual of Tropical and Subtropical Fruits, p. 303.*)

54778. CAPSICUM ANNUUM L. Solanaceæ. **Red pepper.**

From Orangedale, Fla. Seeds presented by J. C. Klein. Received January 19, 1922.

"*Datil* pepper, found in the neighborhood of St. Augustine, where it was grown almost exclusively in the gardens of the Minorcans who told me it was originally native to the island of Minorca and brought from there by the early Minorcan colonists, in 1767, to New Smyrna, St. Johns County.

"I have grown this pepper very successfully for several years. The plant is of sturdy habit, attaining a height of from 4 to 6 feet under favorable conditions. It is a most prolific bearer, next to the *Tabasco* in pungence, and an excellent variety for pepper sauce or for any purpose for which hot peppers are desired.

"Plants can be easily kept from year to year in climates where frosts are liable to occur by covering with bagging or litter, or in the North in greenhouses if only a few plants are desired. Some of my plants are nearly 5 years old." (*Klein.*)

54779. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Rome, Italy. Seeds purchased from Sr. Alberto Vivanti, through Francis B. Keene, American consul. Received January 17, 1922.

Introduced for experimental use by the Office of Forage-Crop Investigations.

54780 and 54781.

From Yokohama, Japan. Seeds purchased from the Yokohama Nursery Co. Received January 9, 1922.

Introduced for experimental use as a stock by specialists in the United States Department of Agriculture.

54780. PRUNUS MUME Sieb. and Zucc. Amygdalaceæ. Japanese apricot.

For previous introduction, see S. P. I. No. 45523.

54781. PRUNUS SERRULATA Lindl. Amygdalaceæ. Flowering cherry.

For previous introduction, see S. P. I. No. 38206.

54782 and 54783.

From Pajahmundry, Nilgiri Hills, India. Seeds presented by William Bembower, agricultural adviser, American Evangelical Lutheran Mission. Received January 4, 1922.

54782. OLEA sp. Oleaceæ. Wild olive.

Wild olive collected in the hills of southern India.

54783. PSIDIUM sp. Myrtaceæ.

"Seeds of a small Psidium which grows wild in the Nilgiri and Pulney Hills of southern India. These were collected at Kotagiri, May, 1921, from a shrub 6 feet high. The plant is abundant around Coonoor." (*Bembower.*)

54784. PAHUDIA RHOMBOIDEA (Blanco) Prain. Cæsalpiniaceæ.

(*Afzelia rhomboidea* Vidal.)

From Manila, Philippine Islands. Seeds presented by Arthur T. Fischer, director of forestry, through Sr. Adn. Hernandez, secretary of Agriculture and Natural Resources. Received January 6, 1922.

"A tree up to 120 centimeters (4 feet) in diameter, straight but not tall. The wood is hard, heavy, seasons well, and is rarely attacked by termites. It is a well-known Philippine cabinet wood." (*Fischer.*)

For previous introduction, see S. P. I. No. 47210.

54785. DAVIDSONIA PRURIENS F. Muell. Cunoniaceæ.

From Brisbane, Queensland. Seeds presented by C. T. White, Government botanist. Received January 9, 1922.

A small (30 to 40 foot) tree of graceful, erect habit with long, drooping pinnate leaves and pendulous clusters of reddish flowers. The oval fruit about the size of a goose egg is covered with short stiff hairs. Rubbing with a rough cloth quickly and easily removes these and exposes the smooth, plumlike, purple skin. The soft, fleshy pulp has a rich purple color and a sharply acid flavor; it contains a few flat, irregularly shaped seeds, which are small for the size of the fruit, a feature not frequently occurring in wild fruits. This "plum," as it is called, is largely used by settlers in Queensland for making jam and jelly. The hard, dark-brown, close-grained wood is tough and durable and is used for tool handles and mallets. This tree is native to tropical Queensland, and a smaller form is found in southern Queensland and adjoining parts of New South Wales. (Adapted from *F. M. Bailey, Queensland Agricultural Journal, vol. 1, p. 471,* and from *The Queensland Flora, p. 538.*)

54786 and 54787. RIBES VULGARE Lam. Grossulariaceæ.

Garden currant.

From Hereford, England. Plants purchased from King's Acre Nurseries. Received January 14, 1922.

Introduced for experimental work by Department of Agriculture specialists.



THE PEJIBAYE PALM, THE SOURCE OF A STAPLE FOOD IN COSTA RICA. (GUILIELMA UTILIS OERST., S. P. I. NO. 54776.)

The date palm, on whose fruit with the addition of a few other foodstuffs thousands of Arabs subsist for a large portion of the year, finds a tropical American counterpart in the pejibaye, which since pre-Columbian days has yielded the principal food of the Indians inhabiting southern Costa Rica. Though its cultivation is now restricted to the region between Lake Nicaragua and Ecuador, it can undoubtedly be grown in many portions of the tropical world. (Photographed by Wilson Popenoe, San José, Costa Rica, June 17, 1920; P17936FS.)



A BUNCH OF SEEDLESS PEJIBAYES. (GUILIELMA UTILIS OERST., S. P. I. No. 54776.)

Though it has been likened to the date palm because of its ability to produce large quantities of nourishing food, the pejibaye differs from the date in that its chestnut-flavored fruits contain starch instead of sugar. Don José Zeledon, of San José, Costa Rica, to whom the Department of Agriculture is indebted for the gift of plants of the seedless pejibaye, a rare and superior variety, is here shown holding a bunch that weighs about 25 pounds. A mature palm frequently bears five or six bunches in a single crop. (Photographed by Wilson Popenoe, San Jose, Costa Rica, June 17, 1920; P17941FS.)

54786 and 54787—Continued.

54786. *Raby Castle.*

For previous introduction, see S. P. I. No. 54773.

54787. *Little Croft Beauty.*

54788 to 54790. JUGLANS REGIA L. Juglandaceæ. Walnut.

From Eskdale, Knutsford, Cheshire, England. Seeds presented by Howard Spence. Received January 20, 1922.

"Walnuts from the lower Himalayas, Northwest Provinces, India, which appear to be similar to those which gave very vigorous, unusually well-rooted plants. If they are of the original type they will be of especial vigor, much more easily transplanted without injury than is the ordinary type, and therefore of value as a stock.

"In this country the growth of these walnuts is much more rapid than either the ordinary *Juglans regia* or *J. nigra;* they appear to suffer much less from leaf attack of various kinds, withstand frost much better than the ordinary *J. regia* or *Royal* or *Paradox*, and have a dense mass of fibrous rootlets with marked absence of excessive taproot. The thick shell safeguards their viability. I have kept some a year unstratified, simply in a drawer, and obtained germination." (*Spence.*)

54788. No. 1.

54789. No. 5.

54790. No. 8.

54791 to 54795.

From Luxey, Landes, France. Seeds presented by L. Rouest, agronomist, Experimental Farm. Received January 17, 1922. Quoted notes by M. Rouest.

54791. DOLICHOS LABLAB L. Fabaceæ. Bonavist bean.

"A Dolichos with violet flowers and black seeds, which is interesting for its resistance to drought; it produces excellent ensilage. This plant, of Egyptian origin, is of the second generation cultivated in France."

54792. LATHYRUS SATIVUS L. Fabaceæ. Bitter vetch.

"*Tangier* vetch, a legume resistant to drought, with a growing period of about 80 days. The forage is much valued for sheep, and the seeds are eaten by the Arabs of Tangier and northern Africa and by the Sicilians."

For previous introduction, see S. P. I. No. 45927.

54793. RAPHANUS SATIVUS L. Brassicaceæ. Radish.

"*Daikon* (Chinese forage crop) useful either for ensilage or as a root crop. Here we sow the seed in July and August. The roots weigh several kilos and can be kept well in winter. They make a good food for milch cows."

54794 and 54795. SOJA MAX (L.) Piper. Fabaceæ. Soy bean.
(*Glycine hispida* Maxim.)

54794. "*Very early Japanese.* A variety growing even farther north than Paris, very productive, and maturing in 90 to 100 days."

54795. "*Very early brown.* A variety growing in Pas de Calais and in eastern France."

54796 and 54797. SORBUS TORMINALIS (L.) Crantz. Malaceæ.

From Elstree, Herts, England. Seeds and plants presented by Hon. Vicary Gibbs. Received January 23, 1922.

This handsome European tree, 30 to 40 (rarely 70 or more) feet in height, is apparently seldom found as a wild tree and is very rare in cultivation. It is said to be very drought resistant; this introduction was made for the purpose of testing its use as an apple and pear stock for dry regions.

For previous introduction, see S. P. I. No. 49432.

54796. Seeds.

54797. Plants.

54798. BROMELIA PINGUIN L. Bromeliaceæ.

From Juan Mina, Canal Zone. Seed collected by Dr. David Fairchild, Agricultural Explorer in Charge of the Office of Foreign Seed and Plant Introduction, Bureau of Plant Industry. Received January 19, 1922.

"Seeds from fruits collected on the Jungle Trail, on the Chagres River, Juan Mina, Canal Zone, September 7, 1921. A wild species of Bromelia, 5 or more feet in height, producing very showy heads of deep-orange flowers the size of a globe artichoke. The individual fruits are easily detached from the head, and when crushed between the teeth provide a small quantity of pleasantly flavored juice." *(Fairchild.)*

For previous introduction, see S. P. I. No. 32382.

54799. ACACIA VEREK Guill. and Perr. Mimosaceæ.

From Khartum, Anglo-Egyptian Sudan. Seeds presented by Maj. R. G. Archibald, Wellcome Tropical Research Laboratories, through Henry S. Wellcome. Received January 19, 1922.

"*Hashab* from Kordofan, which yields the finest qualities of gum arabic." *(Archibald.)*

For experimental growing in the southwestern United States.

For previous introduction, see S. P. I. No. 38524.

54800. COFFEA AMARA Bruijning. Rubiaceæ. **Coffee.**

From Port Louis, Mauritius. Seeds presented by G. Regnard. Received January 13, 1922.

The name *Coffea amara* has been assigned to the *Mautsaka* variety, a caffeine-free coffee from Madagascar, to show that it has characters which distinguish it from other caffeine-free species of Coffea. It has a pleasant aroma but a bitter taste which may be dispelled by cultivation. The disk at the top of the fruit resembles that of *C. libirica* more closely than it does that of *C. arabica*. (Adapted from *Bruijning, Verslagen van Landbouwkundige Onderzoekingen der Rijkslandbouw Proefstations, Netherlands, vol. 18, p. 115.*)

Introduced for the use of specialists in the Department of Agriculture.

For previous introduction, see S. P. I. No. 43073.

54801 to 54804. RIBES VULGARE Lam. Grossulariaceæ. **Garden currant.**

From Woking, Surrey, England. Plants purchased from George Jackson & Son. Received January 21, 1922.

Introduced for experimental work by specialists in the Department of Agriculture.

54801. *Raby Castle.*
54802. *Victoria.*
54803. *White Dutch.*
54804. *White Grape.*

54805. CAMOENSIA MAXIMA Welw. Fabaceæ.

From Cienfuegos, Cuba. Seeds presented by Robert M. Grey, Harvard Experiment Station. Received January 13, 1922.

A delicately beautiful tropical-African leguminous vine with fragrant gold-margined white flowers 8 inches long.

These seeds came from a plant sent Mr. Grey in 1908 under S. P. I. No. 7344.

For previous introduction and description, see S. P. I. No. 49280.

54806 to 54888. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

From Harbin, Manchuria. Seeds presented by B. W. Skvortzow. Received February 28, 1922.

Introduced for experimental work by department specialists.

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54808. No. 95.
54809. No. 96.
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54880. No. 216.
54881. No. 217.
54882. No. 219.
54883. No. 220.
54884. No. 224.
54885. No. 225.
54886. No. 297.
54887. No. 298.
54888. No. 421.

54889. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Groningen, Netherlands. Seeds purchased from C. Broekema. Received March 2, 1922.

Rozendaal red clover.

For previous introduction, see S. P. I. No. 49884.

Introduced for specialists of the Department of Agriculture.

54890 to 54895.

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, in charge, Department of Botany and Forestry, Experimental Station of the Hawaiian Sugar-Planters' Association. Received March 2, 1922. Quoted notes by Doctor Lyon.

54890. ELAEOCARPUS ANGUSTIFOLIUS Blume. Elæocarpaceæ.

"*Djanitri*, from Buitenzorg, Java."

A tall, handsome tree with a lofty crown, from the primeval evergreen forests of Java, where it is found from sea level to an altitude of approximately 4,000 feet. The narrow, partly evergreen leaves become brilliant orange-red before they drop, and the clusters of greenish, silky fringed flowers appear in December. In the late summer the tree bears beautiful blue fruits the size of marbles; the edible portions of these is thin but pleasant flavored and is eaten by the natives. The knobby, grooved stones are exported in large quantities for rosaries.

This tree is useful not only as an ornamental, but also in reforesting denuded mountain sides. (Adapted from *Koorders en Valeton, Mededeelingen uit 's Lands Plantentuin No. 11, p. 260.*)

For previous introduction, see S. P. I. No. 51817.

54891. FICUS EHRETIOIDES F. Muell. Moraceæ.

"Seeds of a tree 60 to 70 feet tall with fruits borne in clusters on the trunk and larger branches, collected in Queensland by C. E. Pemberton."

Magura. A medium-sized Australian tree, 40 to 60 feet in height, having somewhat heart-shaped, globular, edible fruits an inch in diameter. (Adapted from *Bailey, Queensland Flora, pt. 5, p. 1473.*)

54892. FICUS HISPIDA L. f. Moraceæ.

"A hardy shrub, or small tree, collected in Queensland by C. E. Pemberton."

A moderate-sized, rapid-growing tree, native throughout India from the Punjab to Malakka and Ceylon. The somewhat pear-shaped, paired or clustered fruits are yellowish when ripe; they sometimes hang on elongated branches and often reach or even penetrate the soil. The fruit, seeds, and bark are valuable medicinally, and the foliage is used for fodder. (Adapted from *Kirtikar, Indian Medicinal Plants, vol. 2, p. 1196.*)

54893. GREWIA STYLOCARPA Warb. Tiliaceæ.

"Collected in the Philippine Islands by F. X. Williams."

Muling. This Philippine tree, usually small but sometimes more than 50 feet high, bears terminal or axillary clusters of yellowish, pear-shaped, fleshy fruits of a subacid applelike flavor, said to be of excellent quality. It is not cultivated. (Adapted from *Philippine Agricultural Review, vol. 9, No. 3, p. 238.*)

54894. SESBAN AEGYPTIACUM Poir. Fabaceæ.

A stout shrubby plant 6 to 10 feet in height, native to tropical Asia and northern Australia. The yellow flowers, spotted with purple, are borne in axillary clusters about 4 inches long. In Australia the leaves are much relished by live stock, and the wood is used in making charcoal for gunpowder. (Adapted from *Rock, Leguminous Plants of Hawaii, p. 154.*)

54890 to 54895—Continued.

54895. SIDEROXYLON MACRANTHUM Merr. Sapotaceæ.

"Collected in the Philippine Islands by F. X. Williams."

A large Philippine tree with somewhat leathery, shining leaves up to 7 inches in length and small creamy white flowers which are crowded in clusters at the tips of the branches. The roundish fruits, slightly over an inch in diameter, are two to three seeded. (Adapted from *Merrill, New or Noteworthy Philippine Plants No. 4, Manila Bureau of Government Laboratories, No. 35, p. 56.*)

54896 to 54898. ERYTHRINA spp. Fabaceæ.

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, in charge, Department of Botany and Forestry, Experiment Station of the Hawaiian Sugar-Planters' Association. Received March 7, 1922.

"Seeds collected in Honolulu, February, 1922." (*Lyon.*)

54896. ERYTHRINA VARIEGATA Stickm.
(*E. indica* Lam.)

For description, see S. P. I. No. 54898.

54897. ERYTHRINA MONOSPERMA Gaud.

Wiliwili. A tree 6 to 10 meters (20 to 33 feet) in height, with a spreading crown of stiff, gnarled branches and terminal clusters of brick-red, orange, or pale-yellow flowers. The pods contain scarlet or dark-red seeds. The wood is soft and very light and was used by the Hawaiians for the float on the outrigger of their dugout canoes. The tree inhabits dry regions on all the Hawaiian Islands, though cattle have nearly exterminated it on Kauai, Molokai, and Oahu. (Adapted from *Rock, Leguminous Plants of Hawaii, p. 181.*)

54898. ERYTHRINA VARIEGATA Stickm.
(*E. indica* Lam.)

Indian coral tree, or *tiger's-claw.* A moderate-sized, quick-growing, deciduous tree, native throughout India from the foot of the Himalayas into Burma, but cultivated all over the Tropics. The clusters of large, bright-red flowers appear before the leaves. The pods, 4 to 8 inches long, contain several dark-carmine seeds. The flowers are dried for use as a dye; the bark is used for tanning and dyeing and yields an excellent, pale straw-colored fiber. The leaves are used as cattle fodder; the bark and leaves are also used medicinally. The open-grained, light wood is durable and does not split or warp; it is used for boxes, toys, trays, and also for firewood. Much of the lacquered ware of India is made of the wood of this tree. (Adapted from *Rock, Ornamental Trees of Hawaii, p. 119.*)

54899. ZINZIBER sp. Zinziberaceæ. Ginger.

From Canton, China. Seeds presented by F. A. McClure, instructor, Canton Christian College. Received February 20, 1922.

"*Ye Kaung.* A species of ginger with deep-yellow flowers borne on leafless stalks and black seeds in a red receptacle. Found at the edge of a thicket at Patkaleng." (*McClure.*)

54900 and 54901.

From Mayaguez, Porto Rico. Tubers presented by T. B. McClelland, horticulturist, Porto Rico Agricultural Experiment Station. Received March 16, 1922.

54900. DIOSCOREA ALATA L. Dioscoreaceæ. Greater yam.

Purple Ceylon. This yam, so called because of the purple color of its flesh, was imported in 1908 from Ceylon for the experiment station, and, on account of its pleasing flavor, has become a favorite variety. Any part of the tuber may be utilized for planting with the assurance that it will yield a profitable crop. At the experiment station half-pound seed pieces cut from the lower part of the root produced an average of nearly 5 pounds per plant. This is a splendid weight for a

54900 and 54901—Continued.

root of the *Purple Ceylon* variety and compares favorably with that produced by equal-sized pieces of the basal, or upper, part of the root.

The vines of this variety are long, large, vigorous, and four sided. The blade of the leaf is 6 by 4 or 5 inches, and it is dark green. A few small air tubers 2 by 1½ inches develop on the vines of this variety. The edible root is almost spherical or made up of two or three large round lobes. It never forms long, deep-growing roots. The starch content in the fresh root is about 20 per cent. After being cooked this yam has a smooth, even texture and retains its dark-purple color. Its flavor is rich and pleasing and has been highly complimented by all who have tested it. (Adapted from *C. F. Kinman* in *Bulletin 27, Porto Rico Agricultural Experiment Station, pp. 16 and 17.*)

For an illustration of tubers of the Purple Ceylon yam, see Plate III.

54901. DIOSCOREA CAYENENSIS Lam. Dioscoreaceæ. **Yellow Guinea yam.**

Congo. In Mayaguez this is called *Congo amarillo*, but in the San Juan market, where it is found in greater abundance than other kinds, it is known as *Yellow Guinea.* It thrives much better in sandy soil than most yams. The large roots attain a length of a foot, are rather cylindrical, and average a weight of 4 to 5 pounds in favorable seasons. The interior of the starchy root is a rich light yellow and turns dark brown when exposed to the air. It is smoother and more even grained than the water yams and not less so than the roots of the *White Guinea* or the *Potato* yams. It is rich yellow and of good texture when cooked. The flavor is pleasant and compares favorably in richness with the best yams. The vines of this variety are not angled; they are small and very strong and make a moderately vigorous growth. (Adapted from *C. F. Kinman* in *Bulletin 27, Porto Rico Agricultural Experiment Station, pp. 20 and 21.*)

"In addition to the data on quality given by Mr. Kinman, it may be noted that this yam has a slightly bitter taste; on this account special methods of cooking may sometimes be required. It is said that the bitterness is more noticeable in immature tubers than in fully mature ones." (*R. A. Young.*)

For an illustration of tubers of the Congo yam, see Plate IV.

54902. SACCHARUM OFFICINARUM L. Poaceæ. **Sugar cane.**

From Brisbane, Queensland, Australia. Cuttings presented by H. T. Easterby, general superintendent, Bureau of Sugar-Experiment Stations. Received March 7, 1922.

A few years ago a variety of sugar cane called *Shahjahanpur No. 10* was received by the Queensland Bureau of Sugar-Experiment Stations from the Shahjahanpur Sugar-Experiment Station, India, being recommended as a cane which would stand cold weather. This cane was planted out at the Bundaberg station, where it was found to resist severe frosts remarkably well. Its sugar content and cropping qualities being good, it was ultimately distributed to a considerable extent in southern Queensland. A very fine block of this variety, about 12 acres in extent, was grown at Spring Hill. This cane presented a splendid vigorous growth when only 9 months old. It had never been affected by frost. If this variety maintains its reputation, it should be extremely valuable to cane growers who live in regions where frost damage is common. The last analysis of the cane, made at the Bundaberg station last year, gave the following results:

Brix	21.7
Purity of juice	91.0
Percentage of fiber in cane	13.6
Commercial cane sugar	15.05

(Adapted from *The Australian Sugar Journal, vol. 13, p. 336.*)

54903. MALUS DOUMERI (Bois) Cheval. Malaceæ. **Tonkin apple.**
(*Pyrus doumeri* Bois.)

From Laos, French Indo China. Seeds presented by R. Miéville, director, Station Agricole du Tranninh, Chieng Kuang. Received March 11, 1922.



TUBERS OF THE PURPLE CEYLON YAM. (DIOSCOREA ALATA L., S. P. I. No. 54900.)

The Purple Ceylon yam, as shown by these characteristic tubers, is usually somewhat spherical, never elongated. The flesh is deep purple and retains the color when cooked, which makes a dish of this yam exceedingly attractive; the quality is excellent. The tubers shown are much reduced in size. This variety has become such a favorite for table use in Porto Rico that the increase in production has been hindered by the lack of sufficient propagating material. (Photographed by E. L. Crandall, Washington, D. C., March 20, 1922. P27534FS.)



TUBERS OF THE CONGO YAM. (DIOSCOREA CAYENENSIS LAM., S. P. I. No. 54901.)

The Congo yam, shown above greatly reduced in size, has rich yellow flesh strikingly different from all other yams commonly grown. While the flavor is not so delicate as that of many other yams, the texture is good and the color attractive. The average weight of tubers, when grown under favorable conditions, is 4 to 5 pounds. (Photographed by E. L. Crandall, Washington, D. C., March 20, 1922; P27535FS.)

"An interesting wild apple, native to the high plateaus of Indo China, at altitudes of 800 to 2,000 meters (2,620 to 6,562 feet), notably on Langbian and the lesser mountain ranges.

"It is a large tree which produces fruits similar in form, flavor, and color to certain varieties of Normandy cider pears.

"Although the species grows in the open forest and is uncared for by the present mountaineers, it must have been cultivated and improved at some ancient time. There remain specimens cultivated as sacred trees around certain Laos pagodas; here the trees were cared for by priests." (*Aug. Chevalier.*)

For previous introduction, see S. P. I. No. 53008.

54904. PASPALUM NOTATUM Fluegge. Poaceæ. **Grass.**

From San Jose, Costa Rica. Seeds presented by Sr. J. Alfredo Quiros. Received February 24, 1922.

A perennial grass, used for forage in tropical America, introduced for the use of department specialists.

54905. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Warsaw, Poland. Seeds purchased through L. J. Keena, American consul general. Received March 17, 1922.

"The only variety of red-clover seed which appears to be procurable in Poland." (*Keena.*)

Introduced for comparative tests with American-grown clover.

54906 to 54908. COIX LACRYMA-JOBI MA-YUEN (Rom.) Stapf. Poaceæ. **Ma-yuen.**

From Manila, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Bureau of Agriculture. Received March 9, 1922.

"*Adlay.* When it is considered that adlay far surpasses rice in yield, that its analysis is quite similar to that of wheat, that it can be eaten like rice and also can be ground into flour and used in making biscuits and bread, that the grits make an excellent breakfast food, and that it can be grown from sea level to an altitude of more than 3,000 feet, it is fair to assume that it is only a question of time when adlay will be widely cultivated in the Tropics." (*Wester.*)

"Adlay has many qualities over other grains that ought to appeal to the dry-land rice farmers. First, this grain will stand a drought that would kill upland rice and still produce a good crop; second, adlay is a plant that locusts do not seem to bother; I have seen upland rice destroyed by locusts while the adlay planted around the field was not touched by them; third, adlay will produce nearly double the yield per hectare that can be expected from upland rice; fourth, the care and cultivation of 1 hectare of adlay can be carried on at less than one-half the cost of taking care of 1 hectare of upland rice.

"The food value of adlay has been known to the Filipino farmers a long time, and it has been used by them in various ways, roasted in cakes and as a substitute for rice. It also is a first-class feed for poultry." (*W. G. McCarty, supervising agricultural agent, Santa Cruz, Laguna.*)

For further description, see Philippine Agricultural Review, vol. 13, p. 217.

For previous introduction, see S. P. I. No. 54454.

54906. *Adlay No. 1.*

54907. *Adlay No. 2.*

54908. *Adlay No. 3.*

54909. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.**
(*T. vulgare* Vill.)

From Nanking, China. Seeds presented by J. Lossing Buck, acting dean, College of Agriculture and Forestry, University of Nanking. Received March 11, 1922.

"One of our students from Shantung told us that because of floods in the autumn a large amount of wheat was planted in the spring. This is the first time I have heard of spring wheat in China. These seeds are from Tung Tsao, Koo-yung District, Shantung." (*Buck.*)

54910. Myrianthus arboreus Beauv. Moraceæ.

From Zomba, Nyasaland Protectorate. Seeds presented by E. W. Davy, Assistant Director of Agriculture. Received March 13, 1922.

A medium-sized ornamental tree with spreading branches, common in the dense humid forests of tropical Africa at an altitude of about 4,000 feet. The palmate leaves, with five to seven leaflets, are up to 20 inches in length. The male flowers, borne in axillary clusters with peduncles 2 to 7 inches long, form a solid mass of yellow, later becoming brownish gold. The edible golden yellow fruits are up to 4 inches in diameter, with an acidulous-sweet flavor, and in the Southwest Africa Protectorate are much esteemed by the natives who bring them to the coast markets. (Adapted from *Hiern, Catalogue of Welwitsch's African Plants, pt. 4, p. 995; Thiselton-Dyer, Flora of Tropical Africa, vol. 6, pt. 2, p. 231;* and *Wildeman, Mission Emile Laurent, vol. 1, p. 377.*)

For previous introduction, see S. P. I. No. 44250.

54911 to 54917.

From Christiania, Norway. Seeds presented by Haakon Foss, director, Agricultural Experiment Station. Received March 16, 1922. Quoted notes by Mr. Foss.

"Early varieties of barley and oats that have proved valuable in the central mountain districts of Norway. They should be of interest for regions of high altitude and cold climate in the United States.

"The seeds sent were grown chiefly in 1921 at Vindingstad, the experiment farm in the central mountain districts, lying at an elevation of 550 meters (approximately 1,800 feet)."

54911. Avena sativa L. Poaceæ. **Oats.**

"*Perle havre* (pearl oats). An early variety of oats with stiff stems, selected by Doctor Christie, Hamar, Norway. The yield is very high, the average for 1919 to 1921 being 3,300 kilograms of grain and 6,800 kilograms of straw per hectare, or approximately 92 bushels of grain and 2.7 tons of straw per acre. The grain is small, but thin husked and plump, and the plant may be grown at nearly the same altitude as barley."

54912 to 54917. Hordeum vulgare pallidum Seringe. Poaceæ. **Barley.**

54912. "*Opdal cyg.* A local variety of barley originated near Opdal in the central high-mountain region. It is very early ripening and of good yield under low temperature conditions and is used mostly on the border of the grain-growing area."

54913. "*Asplund cyg.* A famous new barley variety of the *hexastichum* type which was selected by a Swedish farmer at Asplund. It is not very early ripening nor very well adapted to low temperature conditions, but under medium conditions it is superior in yield and stem stiffness to all varieties hitherto tested."

54914. "*Björneby cyg.* A widely cultivated variety of barley, originated in the eastern part of Norway. It is used mostly in the lower mountain valleys."

54915. "*Dönnes cyg.* An old local variety of barley originated near Dönnes in Nordland. It is very early ripening and of extremely high yield under low temperature conditions, but of only medium grain qualities."

54916. "*Maskin cyg.* Selected by Doctor Christie. An early-ripening variety with very stiff stems and of high yield. The average for 1920 and 1921 was 3,640 kilograms of grain and 4,260 kilograms of straw per hectare, or approximately 67.6 bushels of grain and 1.7 tons of straw per acre. The quality of the grain is superior."

54917. "*Trysil cyg.* A widely grown variety of barley, originated in the eastern part of Norway. It is used mostly in the lower mountain valleys."

54918 and 54919.

From Tripoli, Libia, Africa. Seeds presented by Dr. E. O. Fenzi. Received March 22, 1922. Quoted notes by Doctor Fenzi.

These are the wild forms of well-known evergreens and may differ from the varieties now cultivated. Both are native to Cyrenaica.

54918. CUPRESSUS SEMPERVIRENS L. Pinaceæ. Cypress.

"This is first found at about 650 feet elevation, but grows at its best above 1,300 feet, where trees 100 feet high and showing the same branching habit as the old cedars of Lebanon are not rare. They are confined to the northern slope of the Cyrenaican plateau, where precipitation is much greater than on the southern slope."

54919. JUNIPERUS PHOENICEA L. Pinaceæ. Juniper.

"The Juniperus is much more plentiful than the Cupressus, so much so as to constitute about 60 per cent of the whole woody vegetation between sea level and 2,600 feet elevation. It may become over 30 feet in height, but is generally smaller. The wood of both species is quite heavy and practically indestructible."

54920 to 54922.

From Mount Silinda, Southern Rhodesia, Africa. Seeds presented by Dr. W. L. Thompson. Received March 22, 1922. Quoted notes by Doctor Thompson.

54920. KHAYA NYASICA Stapf. Meliaceæ. African mahogany.

"The *red mahogany* is one of our most valuable timber trees and is widely distributed over Mozambique. It is fairly rapid in growth, though not equal to some of the eucalypts in this respect. It is found most often growing near streams, but also on high ground at a distance from water. The timber is very durable and is not attacked by white ants or borers."

A huge tree, 150 feet or more in height, with a very straight trunk and an enormous crown of handsome glossy foliage which is not eaten to any extent by locusts. The hard red timber has a beautiful grain and is easily worked. The seeds are boiled and crushed by the natives, who use the resulting oil in their hair to kill vermin. The tree is native to Gazaland, Mozambique, where its native name is *umbaba*. (Adapted from *Journal of the Linnean Society, vol. 40 (Botany), p. 42.*)

54921. STRYCHNOS MELLODORA S. Moore. Loganiaceæ.

"The Strychnos is also prized by us for its timber, which is fine grained and strong, and is used here for tool handles. It is not so large a tree as the *red mahogany*, not usually more than a foot or 15 inches in diameter. It is much more free from the attacks of insects than the *ukuhla* and not so completely immune as the *red mahogany*."

54922. TRICHILIA CHIRINDENSIS Swynn. and Baker. Meliaceæ.

"The *ukuhla* is a fine timber tree except for the fact that white ants and borers attack the wood. I have some bookshelves made of this lumber over 20 years ago which have not been touched by borers since, though they have some borer holes in them, made previous to the lumber being made up into shelves. This immunity is due to chance treatment, lying out in the storms during our rainy season, not to controlled conditions. We have tried soaking the lumber in a pond, but so far have not learned to control conditions so as to be uniformly successful. The seeds are partially covered with a white pulp, inclosed by a bright-red skin, having a nutty flavor, and although there is very little of it on each seed the natives are very fond of it. An oil is also obtained from the seeds. I once obtained some of it from a native; it was quite solid like tallow, and I attempted to make candles of it, but when melted it did not harden again at once on cooling."

54920 to 54922—Continued.

One of the finest forest trees of Gazaland, Mozambique. It has a spreading head of dark glossy leaves, light-gray bark, and dull-white flowers; it makes an excellent shade tree, sometimes becoming 120 feet in height. The timber is reddish brown and easily worked. (Adapted from *Journal of the Linnean Society, vol. 40 (Botany), p. 39.*)

54923 to 54927.

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, in charge, Department of Botany and Forestry, Experiment Station of the Hawaiian Sugar-Planters' Association. Received March 20, 1922. Quoted notes by Doctor Lyon.

These trees were introduced at the suggestion of J. F. Rock, Agricultural Explorer of the United States Department of Agriculture, for trial as ornamentals for southern Florida.

54923. CASSIA NODOSA Buch.-Ham. Cæsalpiniaceæ.

"Seeds collected in Honolulu, February, 1922."

Pink and white shower. This magnificent flowering tree is one of the most commonly cultivated ornamental plants in Honolulu, where it is much used for street planting. It is a moderate-sized, deciduous tree with long drooping branches and glossy leaves; during May and June it bears a profusion of beautiful, bright-pink, rose-scented flowers in dense clusters on long stalks. It is native to India from the eastern Himalayas to the Malay Archipelago, and also to the Philippines. (Adapted from *Rock, Ornamental Trees of Hawaii, p. 106.*)

54924. CASSIA SIAMEA Lam. Cæsalpiniaceæ. **Kassod tree.**

The kassod tree is of rather low stature, with twiggy branches and bluish leaves up to a foot in length. In the late summer and early autumn, when all of the other showy leguminous trees have ceased to bloom, this tree bears axillary and terminal panicles of attractive bright-yellow flowers. In Honolulu it has been planted more or less extensively in private grounds. The native home of the kassod tree is southern India and Malaysia. (Adapted from *Rock, Ornamental Trees of Hawaii, p. 99.*)

54925. LEPISANTHES ERIOLEPIS Radlk. Sapindaceæ.

"Seeds collected in the Philippines by F. X. Williams."

An East Indian tree with pinnate leaves composed of about four pairs of oblong leaflets and small whitish flowers borne in dense panicles. (Adapted from *Actes du Congrès International de Botanistes, 1877, p. 106.*)

54926. POLYSCIAS NODOSA (Blume) Seem. Araliaceæ.

"Seeds collected in the Philippines by F. X. Williams."

The *malapapaya* is a lofty tree found in nearly every Province of the Philippine Islands. It sometimes reaches a height of 100 feet, with a straight trunk and compound leaves over 3 feet in length. The yellowish white, light, very soft wood is considered one of the best match woods and also is valuable for very light construction purposes. (Adapted from *Whitford, Forests of the Philippines, pt. 2 p. 89.*)

54927. STERCULIA sp. Sterculiaceæ.

"Seeds collected in the Philippines by F. X. Williams."

54928. AGATI GRANDIFLORA (L.) Desv. Fabaceæ.

(*Sesbania grandiflora* Poir.)

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, in charge, Department of Botany and Forestry, Experiment Station of the Hawaiian Sugar-Planters' Association. Received March 2, 1922.

A small, rapid-growing, soft-wooded tree, 15 to 20 feet in height, with narrow, pinnate leaves, large pendulous white flowers, and long, sickle-shaped pods.

The fleshy petals are used in curries and soups in the Indian Archipelago, where this tree is native. The leaves and young shoots are sometimes used as fodder. In this country, the far South is the only region suited to this ornamental tree.

For previous introduction, see S. P. I. No. 54468.

54929 to 54958. FRAGARIA spp. Rosaceæ. **Strawberry.**

From Bourg la Reine, France. Plants purchased from Millet & Fils. Received March 28, 1922. Quoted notes from catalogue of Millet & Fils, unless otherwise stated.

"American strawberry breeders are interested in securing from all parts of the world wild species of Fragaria, as well as hybrids and horticultural varieties. The present collection has been introduced at the recommendation of George M. Darrow, of this department, with a view principally to furnishing material for use in the strawberry-breeding work now being conducted by the Department of Agriculture.

"In the development of European strawberries, at least four species have taken part. Prior to 1714, when the large-fruited *Fragaria chiloensis* was introduced into France from Chile, European horticulturists had to content themselves with the small-fruited native strawberries, *F. vesca* (wood strawberry) and *F. elatior* or *F. moschata* (the hautbois), to which was added, shortly after 1600, the American species, *F. virginiana*. These three were intercrossed and gave rise to numerous horticultural forms, which were in turn crossed with the Chilean species. The specific ancestry of many of the cultivated forms is now somewhat obscure and they are here listed as *Fragaria* spp." (*Wilson Popenoe.*)

The following everbearing varieties:

54929 to 54944. FRAGARIA spp. **Hybrid strawberry.**

54929. FRAGARIA sp.

"*Cyrano de Bergerac.* Derived from *St. Joseph.*"

54930. FRAGARIA sp.

"*Jeanne d'Arc.* Resembling *St. Joseph*, but more vigorous and with larger fruits." (*Robinson, Vegetable Garden, p. 702.*)

54931. FRAGARIA sp.

"*La Constante.* This is a synonym of *St. Joseph.*"

54932. FRAGARIA sp.

"*La Perle.* A variety of the highest merit with large pink fruits."

54933. FRAGARIA sp.

"*La Productive.* A cross between *St. Joseph* and *Edward Lefort*; plants vigorous, tall; fruits large, oblong, bright red, with very juicy and very sweet pink flesh. It is an everbearing variety, flowering very early in the spring." (*Robinson, Vegetable Garden, p. 703.*)

54934. FRAGARIA sp.

"*Louis Rossignol.* An improved form of *St. Joseph.*"

54935. FRAGARIA sp.

"*Odette.* An everbearing variety with long fruits of very good quality."

54936. FRAGARIA sp.

"*St. Antoine de Padoue.* A much more vigorous variety than *St. Joseph*, the result of a cross between that variety and *Royal Sovereign.* The large, conical fruits with very sweet, juicy flesh are borne until the end of July, then again in September and October." (*Robinson, Vegetable Garden, p. 703.*)

For previous introduction, see S. P. I. No. 41978.

54929 to 54958—Continued.

54937. FRAGARIA sp.

"*St. Joseph.* A bushy, rather dwarf, trailing plant which bears abundantly through the whole summer up to the first frosts. The medium-sized, heart-shaped fruits have rosy white, juicy, fragrant flesh." (*Robinson, Vegetable Garden, p. 701.*)

The following standard varieties:

54938. FRAGARIA sp.

"*Dr. Hogg.* Very much like the *British Queen* in habit, but with larger, fine scarlet fruits with very solid pinkish juicy flesh having a delicate fragrance." (*Robinson, Vegetable Garden, p. 697.*)

54939. FRAGARIA sp.

"*Docteur Morère.* A very vigorous variety with very large, broad fruits which are deep red when ripe, with pink, sugary flesh resembling that of the Chilean strawberry in flavor." (*Robinson, Vegetable Garden, p. 683.*)

54940. FRAGARIA sp.

"*Espoir.* A vigorous variety with very large dark-red fruits of fine quality."

54941. FRAGARIA sp.

"*Hericart* (*Vtesse H. de Thury*). A medium-sized fruit, of a brilliant-red color and fine quality."

54942. FRAGARIA sp.

"*Louis Gauthier.* A tall, robust plant bearing an abundance of large round pinkish fruits having juicy, fragrant flesh of very good quality." (*Robinson, Vegetable Garden, p. 687.*)

54943. FRAGARIA sp.

"*Madame Meslé.* A vigorous plant, a cross between *General Chanzy* and *Docteur Morère*, which bears an abundance of very large, oblong, tapering fruits of a beautiful vermilion red. The flesh is pink and of a delicate flavor." (*Robinson, Vegetable Garden, p. 689.*)

54944. FRAGARIA sp.

"*White Pineapple.* White fruits with excellent, very abundant, white flesh."

54945 and 54946. FRAGARIA MOSCHATA Duchesne. **Hautbois strawberry.**

54945. "*Belle Bordelaise.* A thickset compact plant with rather long, often conical, fruits which ripen about the middle of June." (*Robinson, Vegetable Garden, p. 677.*)

54946. "*Marguerite Lebreton.* Very early; bears an abundance of long fruits; the best variety for forcing."

54947 to 54958. FRAGARIA VESCA L. **Wood strawberry.**

54947. "*Belle de Meaux.* Dark-red fruits, somewhat elongated, with red flesh of excellent quality."

54948. "*Belle de Paris.* An everbearing variety with mottled leaves and very large, spherical (sometimes flattened) fruits. One of the best."

54949. "*Belle de Peraudiere.* Blunt red fruits with fragrant flesh."

54950. "*Belle du Mont-Cenis.* Large, white, very good fruits."

54951. "*Belle du Mont Dore.* A somewhat elongated fruit with firm yellow flesh."

54952. "*Bush white.* An alpine bushy variety with white fruits." (*Robinson, Vegetable Garden, p. 675.*)

54929 to 54958—Continued.

54953. "*Gaillon de Semis.* One of the more vigorous of the everbearing varieties; for use on poor or wornout soils. Excellent as a border."

54954. "*Janus.* A very fine alpine variety, very productive, with large, conical fruits which are almost black when ripe. It comes true from seed." (*Robinson, Vegetable Garden, p. 675.*)

54955. "*Madame Beraud.* A blunt variety with obtuse red fruits of very good quality."

54956. "*Marie de Volder.* Elongated fruits of excellent quality."

54957. "*Millet.* A rather early robust variety with bright-red conical and flattened fruits with exquisite sugary flesh."

54958. "*President Meuren.* A variety with very fine, highly colored, somewhat elongated fruits."

54959 to 54962. CAPSICUM ANNUUM L. Solanaceæ. **Red pepper.**

From Granada, Spain. Seeds purchased by Miss Ola Powell from Sr. Juan Leyva, Granada, Spain, through Gaston Smith, American consul. Received March 30, 1922. Quoted notes by Miss Powell.

"These peppers were much larger than any pimientos I have seen growing in the United States. The flesh was very thick and crisp and of delicious flavor. I ate them as one would eat apples."

54959. "*Cornicabra de Murcia.* This is the one which is most extensively grown in Murcia and used for making ground sweet pepper. I ate many of them while in Spain. Although I was told it was too early in the season to get this year's finished product, it seemed to me that the flavor and color had been remarkably retained."

54960. "*De cuatro cascas.* The largest pimiento I found; it is claimed to be the earliest ripening pepper. There did not appear to be very many fruits to each plant. If this variety can be made to ripen early in the United States I am sure it will prove a good one for use among Home-Demonstration Club members."

54961. "*Dulce de España.* A thick-fleshed variety of delicious flavor; the plants were no larger than those of *De cuatro cascas*, but they seemed to bear more fruit. It is rather longer than the others and is the sweet pepper used for canning in Spain."

54962. "*Morrón granadino* (heart-shaped). A rather choice improved variety."

54963. BARRINGTONIA ASIATICA (L.) Kurz. Lecythidaceæ.

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, in charge, Department of Botany and Forestry, Experiment Station of the Hawaiian Sugar-Planters' Association. Received March 17, 1922.

A large, handsome, East Indian tree with thick, leathery, shining, bright-green leaves and very conspicuous flowers with four white petals and numerous crimson-tipped stamens, resembling a brush. The fruit is quite large and is the shape of a 4-sided pyramid; it is smooth on the outside and contains one seed. The tree forms extensive beach forests on some of the Pacific islands. In the Molukkas an illuminating oil is extracted from the seeds, and the dry fruits are gathered by the natives and used as floats for their fish nets. (Adapted from *Rock, Ornamental Trees of Hawaii, p. 663.*)

"Mr. Rock believes that this tree should be planted on the sandy beaches and keys of Florida." (*David Fairchild.*)

For previous introduction, see S. P. I. No. 36867.

54964 to 54966. CERATONIA SILIQUA L. Cæsalpiniaceæ. **Carob.**

From Malaga, Spain. Budwood presented by Sr. Luis Liro Ortiz, through Gaston Smith, American consul, Malaga, Spain. Received March 30, 1922. Quoted notes by Sr. Ortiz, unless otherwise stated.

"In recent years carob cultivation has received serious attention in California, and efforts have been made to secure the best varieties from the Mediterranean region for trial in that State. These three which have been sent in by Sr. Luis Liro Ortiz are recommended as some of the best which are grown in the region of Malaga." (*Wilson Popenoe.*)

"With the exception of the *Castellana*, the carob grows in all this region without any cultural attention, often having the appearance of a wild tree. The *Castellana* is the only sort propagated by grafting. It is considered to be the most productive of all."

54964. "*Bravie.* Cuttings from a 35-year-old tree growing on the property of Basilia Mira Gutierrez, at Pago del Pino, District of Torrox. The tree receives no care whatever and is growing in dry, stony soil; in spite of these conditions, it produces long pods, somewhat more slender than those of *Castellana.*'

54965. "*Castellana.* Cuttings from a tree growing on the property of the widow of Salvador Mira Rico, at Pago del Pino, in the District of Torrox, Province of Malaga. The rootstock is of the *Bravie* variety and was top-worked to *Castellana* seven years ago. At present it yields excellent crops of long carobs, in spite of the fact that it is never pruned nor cultivated and that it is growing on stony land."

"The pods of this variety are about 8 inches long, plump, and very sweet. It appears to be an excellent sort." (*Wilson Popenoe.*)

54966. "*Macho.* Cuttings from a tree 30 to 35 years old, growing on the property of Salvador Molina Sanchez, at Pago del Pino, District of Torrox. The tree has been abandoned and stands on dry, rocky ground; in spite of this, it produces a large quantity of short, broad carobs."

54967. DIOSCOREA TRIFIDA L. f. Dioscoreaceæ. **Yampi.**

From Panama, Canal Zone. Collected by Dr. David Fairchild, Agricultural Explorer in Charge of the Office of Foreign Seed and Plant Introduction, Bureau of Plant Industry. Received October 3, 1921. Numbered March, 1922.

"This is a purple-skinned variety of the yampi. The yampi is not a strong grower, but since some of the most delicious of all the tropical yams belong to this species it will be well worth while if some of the varieties can be grown successfully in Florida. The leaves of this variety are five-lobed and the stem two to four winged, with purple lines on the wings." (*R. A. Young.*)

54968. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

From Harbin, Manchuria. Seeds presented by B. W. Skvortzow. Received February 28, 1922.

Introduced for experimental work by specialists of the Department of Agriculture.

INDEX OF COMMON AND SCIENTIFIC NAMES.

Abutilon theophrasti, 54748.
avicennae. See *A. theophrasti*.
Acacia verek, 54799.
Afzelia rhomboidea. See *Pahudia rhomboidea*.
Agati grandiflora, 54928.
Aleurites fordii, 54738.
montana, 54703.
Alfalfa, *Medicago sativa:*
Alps, 54729.
Poitou, 54730.
Provence, 54731.
Amaranthus caudatus, 54732.
gangeticus melancholicus, 54733.
Ampelocissus imperialis, 54727.
Andropogon rufus. See *Cymbopogon rufus*.
Annona sp., 54682.
Apple, Tonkin, *Malus doumeri*, 54903.
Apricot, Japanese, *Prunus mume:*
Beni Kaga, 54709.
Sashi, 54710.
Bungo, 54711.
Hanakami, 54712.
Inkyo, 54713.
Joshu, 54714.
Kichirobei, 54715
Ko mume, 54716.
Koshu, 54717.
Masui, 54718.
Rinshu, 54719.
Shidare, 54720, 54721.
Shira Kaga, 54722.
Tama mume, 54723.
Unnamed, 54780.
Unryu, 54724.
Yoro, 54725.
Avena sativa, 54911.

Bactris utilis. See *Guilielma utilis*.
Barley. See *Hordeum* spp.
Barringtonia asiatica, 54963.
Bean, bonavist, *Dolichos lablab*, 54791.
soy, *Soja max*, 54794, 54795, 54806–54888, 54968.
Belvedere, *Kochia scoparia*, 54734.
Berry, Colombian, *Rubus macrocarpus*, 54701.
Bromelia pinguin, 54798.
Bucklandia populnea, 54692.
Bupleurum fruticosum, 54693.

Camoensia maxima, 54805.
Capsicum annuum, 54778, 54959–54962.
Carob, *Ceratonia siliqua:*
Bravie, 54964.
Castellana, 54965.
Macho, 54966.
Cassia grandis, 54706.
nodosa, 54923.
siamea, 54924.
Casuarina sumatrana, 54705.
Ceratonia siliqua, 54964–54966.
Cherry, bush, *Prunus tomentosa*, 54757.
flowering, *Prunus serrulata*, 54781.
Chilacayote, *Cucurbita ficifolia*, 54700.
Chirimoriñon, *Annona* sp., 54682.
Citrus sinensis, 54699.
Clover, red, *Trifolium pratense*, 54707, 54708, 54728, 54739, 54779, 54889, 54905.
Coffea amara, 54800.
arabica, 54683.
liberica, 54684.
Coffee. See *Coffea* spp.
Coix lacryma-jobi ma-yuen, 54906–54908.
Cotton. See *Gossypium* spp.
Cowpea, *Vigna sinensis*, 54760.
Cucurbita ficifolia, 54700.
Cupressus sempervirens, 54918.
Currant, garden, *Ribes vulgare:*
Comet, 54770.
Little Croft Beauty, 54787.
New Red Dutch, 54771.
Perfection, 54772.
Raby Castle, 54773, 54786, 54801.
Red Dutch, 54774.
Red Grape, 54775.
Victoria, 54802.
White Dutch, 54803.
White Grape, 54804.
Cymbopogon rufus, 54679.
Cypress, *Cupressus sempervirens*, 54918.

Danthonia setacea, 54736.
Davidsonia pruriens, 54785.
Dioscorea alata, 54900.
cayenensis, 54901.
trifida, 54686, 54967.
Diospyros kaki, 54681, 54741.
Dolichos lablab, 54791.

Echinochloa colonum, 54678.
crusgalli edulis, 54749, 54750.
Elaeocarpus angustifolius, 54890.
Erythrina indica. See *E. variegata*.
monosperma, 54897.
variegata, 54896, 54898.

Eugeissona triste, 54768.
Eugenia brasiliensis. See *E. dombeyi*.
dombeyi, 54777.
klotzschiana, 54702.

Ficus chretioides, 54891.
hispida, 54892.
Fig, Indian, *Opuntia ficus-indica*, 54689.
Flacourtia euphlebia, 54691.
Fragaria spp., 54929–54944.
moschata, 54945, 54946.
vesca, 54947–54958.

Galphimia brasiliensis. See *Thryallis brasiliensis*.
Ginger, *Zinziber* sp., 54899.
Glycine hispida. See *Soja max*.
Gossypium barbadense, 54688.
nanking, 54685.
Grape, Amur, *Vitis amurensis*, 54758, 54759.
Grass, *Echinochloa* spp, 54678, 54749, 54750.
jaragua, *Cymbopogon rufus*, 54679.
kangaroo, *Themeda australis*, 54737.
molasses, *Melinis minutiflora*, 54680.
Paspalum notatum, 54904.
wallaby, *Danthonia setacea*, 54736.
Grewia stylocarpa, 54893.
Grumichama, *Eugenia dombeyi*, 54777.
Guilielma utilis, 54776.

Hordeum vulgare coeleste, 54742.
vulgare pallidum, 54912–54917.
Hydnocarpus anthelminthica, 54726.

Joseph's-coat, *Amaranthus gangeticus melancholicus*, 54733.
Juglans regia, 54788–54790.
Juniper, *Juniperus phoenicea*, 54919.
Juniperus phoenicea, 54919.

Kaki, *Diospyros kaki*, 54681, 54741.
Kassod tree, *Cassia siamea*, 54924.
Khaya nyasica, 54920.
Kochia scoparia, 54734.

Lanagon, *Flacourtia euphlebia*, 54691.
Lathyrus sativus, 54792.
Lepisanthes eriolepis, 54925.
Love-lies-bleeding, *Amaranthus caudatus*, 54732.

Mahogany, African, *Khaya nyasica*, 54920.
Maikrabao, *Hydnocarpus anthelminthica*, 54726.
Majanji, *Uapaca kirkiana*, 54769.
Malapapaya, *Polyscias nodosa*, 54926.
Malus doumeri, 54903.
Mangifera indica, 54690.
Mango, Victoria, *Mangifera indica*, 54690.
Ma-yuen, *Coix lacryma-jobi ma-yuen*, 54906–54908.
Medicago falcata, 54751.
sativa, 54729–54731.
Melinis minutiflora, 54680.
Mesua ferrea, 54687.
Millet, barnyard, *Echinochloa crusgalli edulis*, 54749, 54750.
Mu-oil tree, *Aleurites montana*, 54703.
Myrianthus arboreus, 54910.

Oats, *Avena sativa*, 54911.
Olea sp., 54782.
Olive, wild, *Olea* sp., 54782.
Olombé, *Solanum pierreanum*, 54695.
Opuntia ficus-indica, 54689.
Orange, *Citrus sinensis*, 54699.
Oryza sativa, 54743, 54744.

Pahudia rhomboidea, 54784.
Palm, *Eugeissona triste*, 54768.
Phoenix ouseleyana, 54767.
Panicum miliaceum, 54752–54755, 54762–54766.
Paspalum notatum, 54904.
Pejibaye, *Guilielma utilis*, 54776.
Pepper, red, *Capsicum annuum:*
Cornicabra de Murcia, 54959.
Datil, 54778.
De cuatro cascas, 54960.
Dulce de España, 54961.
Morrón granadino, 54962.
Pera do campo, *Eugenia klotzschiana*, 54702.
Phoenix ouseleyana, 54767.
Pistacia lentiscus, 54694.
Plum, Japanese, *Prunus salicina*, 54756.
Polyscias nodosa, 54926.
Proso, *Panicum miliaceum*, 54752–54755, 54762–54766.
Prunus mume, 54709–54725, 54780.
salicina, 54756.
serrulata, 54781.
tomentosa, 54757.
***Psidium* sp.**, 54783.
Pyrus doumeri. See *Malus doumeri*.

Radish, Daikon, *Raphanus sativus*, 54793.
Raphanus sativus, 54793.
Ribes vulgare, 54770–54775, 54786, 54787, 54801–54804.
Rice, *Oryza sativa*, 54743, 54744.
wild, *Zizania latifolia*, 54761.
Rosa gentiliana, 54735, 54740.
Rose, *Rosa gentiliana*, 54735, 54740.
Rubus macrocarpus, 54701.

Saccharum officinarum, 54902.
Sesban aegyptiacum, 54894.
Sesbania grandiflora. See *Agati grandiflora*.
Sideroxylon macranthum, 54895.
Soja max, 54794, 54795, 54806–54888, 54968.

Solanum pierrcanum, 54695.
Sollya heterophylla, 54696.
Sorbus torminalis, 54796, 54797.
Sterculia sp., 54927.
Stevia rebaudiana, 54677.
Strawberry:
hautbois, *Fragaria moschata:*
Belle Bordelaise, 54945.
Marguerite Lebreton, 54946.
hybrid, *Fragaria* spp.:
Cyrano de Bergerac, 54929.
Dr. Hogg, 54938.
Docteur Morère, 54939.
Espoir, 54940.
Herlcart, 54941.
Jeanne d'Arc, 54930.
La Constante, 54931.
La Perle, 54932.
La Productive, 54933.
Louis Gauthier, 54942.
Louis Rossignol, 54934.
Madame Meslé, 54943.
Odette, 54935.
St. Antoine de Padoue, 54936.
St. Joseph, 54937.
White Pineapple, 54944.
wood, *Fragaria vesca:*
Belle de Meaux, 54947.
de Paris, 54948.
de Peraudiere, 54949.
du Mont Cenis, 54950.
du Mont Dore, 54951.
Bush white, 54952.
Gaillon de Semis, 54953.
Janus, 54954.
Madame Beraud, 54955.
Marie de Volder, 54956.
Millet, 54957.
President Meuren, 54958.
Strychnos mellodora, 54921.
Sugar cane, *Saccharum officinarum*, 54902.

Themeda australis, 54737.
Thryallis brasiliensis, 54697.
Trichilia chirindensis, 54922.
Trifolium pratense, 54707, 54708, 54728, 54739, 54779, 54889, 54905.
Triticum aestivum, 54745–54747, 54909.
vulgare. See *T. aestivum*.
Tung-oil tree, *Aleurites fordii*, 54738.

Uapaca kirkiana, 54769.
Ukuhla, *Trichilia chirindensis*, 54922.

Vetch, bitter, *Lathyrus sativus*, 54792.
Vigna sinensis, 54760.
Vitis amurensis, 54758, 54759.
imperialis. See *Ampelocissus imperialis*.
Voandzeia subterranea, 54704.

Walnut, *Juglans regia*, 54788–54790.
Wheat, common, *Triticum aestivum*, 54745–54747, 54909.

Yam, greater, *Dioscorea alata*, 54900.
Yellow Guinea, *Dioscorea cayenensis*, 54901.
Yampi, *Dioscorea trifida*, 54686, 54967.

Zanthoxylum alatum planispinum, 54698.
Zinziber sp., 54899.
Zizania latifolia, 54761.

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Issued December, 1923.

U. S. DEPARTMENT OF AGRICULTURE.

BUREAU OF PLANT INDUSTRY.

INVENTORY

OF

SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM APRIL 1 TO JUNE 30, 1922.

(No. 71; Nos. 54969 to 55568.)

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CONTENTS.

	Page.
Introductory statement	1
Inventory	7
Index of common and scientific names	59

ILLUSTRATIONS.

	Page.
PLATE I. One of the white sapotes of Central America. (*Casimiroa tetrameria* Millsp.; S. P. I. No. 55445)	44
II. A rare species of white sapote. (*Casimiroa tetrameria* Millsp.; S. P. I. No. 55445)	44
III. The barajillo, a new leguminous shrub from Salvador. (*Meibomia rensoni* Painter; S. P. I. No. 55446)	44
IV. Young branches of the barajillo. (*Meibomia rensoni* Painter; S. P. I. No. 55446)	44
V. A jujube for moist tropical regions. (*Ziziphus mauritiana* Lam.; S. P. I. No. 55485)	50
VI. Barbados Red, a good variety of tropical yam. (*Dioscorea alata* L.; S. P. I. No. 55561)	50

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NEW YORK
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GARDEN

INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM APRIL 1 TO JUNE 30, 1922 (NO. 71; NOS. 54969 TO 55568).

INTRODUCTORY STATEMENT.

The migrations of cultivated plants are slow when compared with the spread of ideas or inventions, but it would surprise anyone who has not paid much attention to the subject to learn of the steady flow of new varieties which is going on from the old to the new countries. This inventory represents the stream which is reaching America through the carefully supervised Government channel.

As we look over the immigrants which have arrived during the last three months we are struck with the fact that most of those which are coming in will require a long period of acclimatization, and many of them will need to be bred with those varieties which we already have before they will prove their full value to the country. Just as the human immigrants who arrive at Ellis Island are amalgamating slowly but surely with those who came years ago, so these plant immigrants, many of them at least, will be known by the particular characters which they have contributed to the cultivated plants already here to which they are related; for, like all other living things, the cultivated plants on which we subsist are continually changing under the hands of the plant breeders and through the unconscious process of selection which is always going on.

The fact that these plants which are introduced need to be selected and bred simply emphasizes the lamentable circumstance that there are too few plant breeders in America and too little encouragement is given to those few to carry on this painstaking long-time work of breeding and selecting plants.

The general public has scarcely begun to realize the self-sacrifice and lifelong devotion to its study which the successful plant breeder must give to any plant before he brings about any permanent improvement in it or the ease with which years of effort may be wiped out in a single season of unfortunate occurrences. Neither has the public appreciated that the emoluments which come to the plant breeder are rarely sufficient to cover even the expenses of cultivation and the care which the plants have required, so that at the end of a life of devotion to this work the breeder often finds himself impoverished by the expenses of the upkeep of his collections. It is this condition more than any other which is retarding the development of our cultivated plants to-day, and it is a condition which should be remedied.

This inventory describes under Nos. 55031 to 55039 nine newly originated varieties of Finnish oats sent in from Helsingfors, some of which are reported to be improvements over the Guldregn variety, which is a standard in Finland, and others which are said to be particularly suited for cultivation on swampy land.

Sixty varieties of sorghum have been collected for Mr. Vinall, the sorghum specialist of the department, by the director of agriculture of the Sudan Government from all over the Anglo-Egyptian Sudan in the region tributary to Khartum (Nos. 55106 to 55165).

For the strawberry breeders the Irapuato variety (No. 54976) from the famous strawberry region of that name in Mexico will be of interest.

The search for varieties of corn which may furnish new characters to be incorporated into our American varieties has been extended to eastern Asia, and through our agricultural explorer, Mr. Rock, we have received from the slopes of Doi Chang Mountain, in upper Siam, a variety (No. 55045) which from time immemorial has been grown by the Miaos, those jungle natives who have long inhabited the high mountains of Siam and who are corn-eating people, despite the fact that all around them the Siamese and Chinese subsist on a diet of rice.

For the pear breeders and those particularly interested in the discovery of a better stock than the one we have for the cultivated pear Mr. Rock has secured seeds of *Pyrus pashia* (No. 54998) from the region of Kengtung, Burma, which, according to the information he could obtain, is used by the natives there as a stock for the sand pear. He has also sent in two new forms (Nos. 55497 and 55550) which he found cultivated near Talifu, in the Province of Yunnan.

Whether the sugar cane (No. 55501) which Mr. Rock found in cultivation in the dry arid region of Yunnan at 6,000 feet elevation will prove a shorter season variety than those we now have, only a trial will disclose.

Mr. Rock's discovery and introduction of the new species of cherry, *Prunus majestica* (Nos. 55417, 55476, 55498, and 55500), from this same region of Yunnan, where, he reports, it makes a tree 30 feet high on the exposed dry ridges 6,000 feet above sea level and produces its juicy bitter-fleshed fruits in great abundance in February and March, may mean the origination of cherries for our Southern States or it may mean a new stock for the cultivated cherry of the North which is more drought resistant than the mazzard or the mahaleb.

Whether one or other of these discoveries which Mr. Rock has made will, after the lapse of years, repay him in a measure for the months of hard work and discomfort and isolation which he has been through in his difficult journey into Yunnan from Siam over trails which have never been traveled before by botanists, or whether it will be the loveliness of his new flowering Cassia (No. 55049), which he discovered near Szemao and which in March he found covered with a mass of deep-pink flowers, time alone will show.

From peach seeds introduced several years ago from Valencia, Spain, there have originated at the Chico Plant Introduction Garden two new and, Mr. Morrow believes, particularly promising varieties of peaches for canning purposes (Nos. 55563 and 55564).

As a result of Mr. Popenoe's exploring work in Ecuador there have come in the seeds of two rather unusual varieties of potato from an altitude of 11,000 feet in the Ecuadorian Andes, in Carchi Province (Nos. 55557 and 55558).

From the new Republic of Czechoslovakia a collection of apple varieties (Nos. 55212 to 55232) has been received through the kindness of Josef Mazanek, but whether or not any of them will prove better than our commercial sorts will have to be determined. They are some of the noted sorts of that region.

The introduction of *Microcitrus inodora* from the Bellenden Ker Range of mountains of northern Queensland is of particular interest, inasmuch as this species, according to Doctor Swingle, the citrus specialist of the Bureau of Plant Industry, is the only one of the whole genus which bears fruit in its wild state of sufficiently good quality to make it of promise for cultivation without any improvement. We are especially indebted to C. T. White for the Russell River lime (No. 55447), as it is called in Queensland.

The matasano of Honduras, *Casimiroa tetrameria* (No. 55445), while not so hardy as its relative the white sapote, *C. edulis*, bears much larger fruit, and since it has shown its ability to grow well and fruit in southern Florida its wide dissemination there is considered a matter of importance.

In the category of secondary fruits of value to the housewife for preserves and for stewing appears to be the Indian jujube (*Ziziphus mauritiana*, No. 55485), bushes of which have borne heavily at Miami, Fla. Since in India there are cultivated forms of this fruit, which might be called a kind of southern crab apple, that seem to be superior, it has seemed important to get them.

Doctor Shantz during his explorations in South Africa was so impressed by the possibilities of the narras (*Acanthosicyos horrida*, No. 55486), a species of cucurbit which the Hottentots almost live upon during certain months of the year, that a new importation of the seeds has been made. This cucurbit, which forms spiny thickets in the Kalahari Desert, bears melonlike fruits, the seeds and flesh of which are keenly relished by the natives. If it can be established in our own southwestern deserts it may prove a very valuable acquisition.

The gum arabic of commerce constitutes a specialized industry in Arabia and the east coast of Africa, and although it is doubtful whether labor conditions would make it possible to develop the culture of the gum-yielding species of Acacias in our own deserts, their introduction for the trial seems worth making. Through the kindness of Mr. Massey, Government botanist of the Anglo-Egyptian Sudan, and of the director of the Wellcome Tropical Research Laboratories in Khartum, a collection of the best species has been made (Nos. 55419 to 55423).

The successful introduction by Mr. Rock of the true chaulmoogra-oil-producing species of tree has led to a search for all those other representatives of the Flacourtiaceæ from the seeds of which a similar oil is obtainable, with the result that from Sierra Leone we have secured *Oncoba echinata* (No. 55465), which Dr. F. B. Power assures us has been shown to bear seeds from the oily content of which the true chaulmoogric acid has been isolated. As this is a shrub

and not a forest tree its culture may be more easily accomplished than will be the culture of the Burmese and Siamese trees. Should this be the case the supply of this oil, which has proved so great a remedy for leprosy, may be more quickly insured. The seeds have been supplied by Mr. King-Church, the conservator of forests at Freetown, Sierra Leone, Africa.

In the Plant Introduction Garden at Miami one of the first introductions of the Guatemalan avocado was planted in 1906, and around it were planted other introductions, many of them belonging to the West Indian type. Mr. Simmonds has found this Collins variety a very good stock for our later introductions of Guatemalan avocados, and one of the first of these seedlings to come into bearing has yielded unusually good fruit and shows decided signs of being a hybrid. It has attracted the attention of the growers in Florida, and there has come a demand for it for orchard plantings. We have entered it as a new introduction (No. 55509), calling it the Collinson.

Although it is difficult to wean northerners from the vegetables of their childhood, the scarcity in the summer of green vegetables in the South has made those living there interested in getting forms which will give tender leafy material for greens throughout the hot months. The West Indian spinach (*Amaranthus viridis*, No. 55405) from Montserrat, which Mr. Thompson, of Antigua, assures us produces leaves the size of dessert plates and which throughout the recent severe drought on the island yielded greens twice a week for the table, may be one of these new and valuable summer vegetables.

Dr. Carlos Renson, of Salvador, the discoverer of a species of Meibomia which he states is very resistant to prolonged drought and is at the same time an excellent nitrogen gatherer, has sent in some seeds of this new cover crop (*Meibomia rensoni*, No. 55446) for trial, and it is to be hoped that it will do as well in other tropical regions as it does with him.

The wistaria has come to have so important a place in the ornamental horticulture of the temperate zone that we presume it is quite too much to hope that any of the wistarialike climbers will ever compete with it, although we must confess that *Petraea volubilis* as grown in Florida runs it a close second. Sir Hugh Dixson, of Abergeldie, New South Wales, has sent in seeds of *Millettia megasperma* (No. 55565), which bears sweet-scented wistarialike flower clusters of a darker hue than the Chinese wistaria and in his grounds has proved to be a most beautiful decorative vine.

The great similarity of the Atlantic coast of America to that of eastern and even parts of western China makes the trial of a large number of newly introduced species of ornamental perennials and flowering shrubs from Szechwan of unusual interest. Through the kindness of A. K. Bulley, of Neston, England, it is hoped to place in the hands of American amateurs a large collection of new and as yet unidentified species of Anemone, Campanula, Caragana, Clematis, Delphinium, Deutzia, Euonymus, Fritillaria, Gentiana, Hemerocallis, Iris, Lilium, Lonicera, Rhododendron, and others which have been gathered together by his collector, Dr. F. Kingdon Ward (Nos. 55253 to 55366).

The hibiscus in its various forms is one of the real glories of the Tropics, and through the work of breeding and selection of certain

American amateurs in Honolulu there have been brought into existence some superb varieties which are little known outside of the Hawaiian Islands. Through the kindness of Mrs. J. Rappe Myers, who has gathered together 54 varieties from her various friends, we are now in possession of an extensive collection of these superb forms and shall distribute them in the Tropics (Nos. 55057 to 55064 and 55166 to 55211).

To enrich the park collections of the country we have received from the firm of Vilmorin-Andrieux & Co. some of the rare flowering shrubs which Maurice L. Vilmorin gathered from various parts of the world into his arboretum (Nos. 55071 to 55098). Among them are rare species of Berberis, Buddleia, Cotoneaster, Deutzia, *Ligustrum delavayanum*, *Rosa omeiensis pteracantha*, and others.

The botanical determinations of seeds introduced have been made and the nomenclature determined by H. C. Skeels, and the descriptive matter has been prepared by Paul Russell, who has had general supervision of this inventory.

DAVID FAIRCHILD,
Agricultural Explorer in Charge.

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION,
Washington, D. C., February 10, 1923.

38640—23——2

INVENTORY.[1]

54969. MYRCIARIA CAULIFLORA (Mart.) Berg. Myrtaceæ.
Jaboticaba.

From Minas Geraes, Brazil. Seeds turned over to this office by the Federal Horticultural Board. Received May 11, 1922.

"The *jaboticaba* is one of the best indigenous fruits of southern Brazil, but like many of the others it has received little attention outside of its native home. Its habit of producing the fruit directly upon the trunk and larger limbs, together with the unusual beauty of its symmetrical and umbrageous head of pale-green foliage, make this a peculiarly striking tree. The tree reaches a height of 35 or 40 feet on rich soil, the leaves are narrowly oval, and the small white flowers are produced singly or in clusters on the bark of the trunk and limbs. The fruit is round, one-half to 1½ inches in diameter, maroon-purple in color, and with a rather thick, tough skin. The translucent juicy pulp, white or rose tinged, is of agreeable vinous flavor. These fruits are eaten fresh or as jelly. The tree would probably prove most suitable for our tropical dependencies, although perhaps it could be grown in favorable spots in southern California and southern Florida." (*Wilson Popenoe.*)

54970. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Calgary, Alberta, Canada. Seeds presented by G. M. Stewart, district inspector, seed branch, Department of Agriculture. Received May 31, 1922.

"Produced by a grower in one of our irrigated districts. This grower has been producing from one to two carloads of timothy seed yearly and has been using the one strain of seed all the time." (*Stewart.*)

Locally grown seed introduced for experiments in timothy breeding.

54971. VICIA ERVILIA (L.) Willd. Fabaceæ. **Vetch.**

From Ariana, near Tunis, Africa. Seeds presented by F. Boeuf, chief, Botanical Service of Tunis. Received May 31, 1922.

Introduced for experiments in the use of vetches as forage crops.

54972. BRASSICA PEKINENSIS (Lour.) Gagn. Brassicaceæ.
Pai ts'ai.

From Min Hsien, Kansu, China. Seeds presented by Willis H. Ruhl. Received June 2, 1922.

A good variety of *Pai ts'ai* from Min Hsien, Kansu, China.

[1] It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in this inventory are those under which the material was received when introduced by the Office of Foreign Seed and Plant Introduction and, further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in this inventory will be subject to change with a view to bringing the forms of the names into harmony with recognized American codes of nomenclature.

54973. HYLOCEREUS POLYRHIZUS (Weber) Britton and Rose. Cactaceæ.

From Guayaquil, Ecuador. Seeds presented by Dr. Frederic W. Goding, American consul general, Guayaquil. Received June 2, 1922.

"A triangular-stemmed cactus which is very abundant in the region about Guayaquil, where it may be seen climbing the trunks of various trees by means of aerial roots. It is also found in sandy places in the neighborhood of Riobamba, where it does not climb trees. The local name of this cactus is 'pitajaya.' The roundish fruits are 5 to 7 inches long, with a thin, strawberry-red skin inclosing a mass of reddish pulp containing many small black seeds. This pulp is of most delicious flavor, and from it is made a cooling drink, called locally 'refresco,' which is superior to any other I have ever tasted." (*Goding.*)

54974. VICIA FABA L. Fabaceæ. **Broad bean.**

From Granada, Spain. Seeds purchased from Don Juan Leyva, Granada, by Miss Ola Powell, States Relations Service, through Gaston Smith, American consul, Malaga, Spain. Received April 17, 1922.

"*Habas granadina.* A large, tender bean." (*Powell.*)

Introduced for experiments in the use of broad beans as forage.

54975. DIOSCOREA ESCULENTA (Lour.) Burkill. Dioscoreaceæ. **Lesser yam.**

From Mayaguez, Porto Rico. Tubers presented by T. B. McClelland, horticulturist, Porto Rico Agricultural Experiment Station. Received May 4, 1922.

Potaio. A small-tubered variety from Africa, resembling the Irish potato and known in Porto Rico as the *Potato* yam. In some places it is considered among the best for home planting, and in a few city markets it brings good prices.

The vines of this variety are slender and round stemmed, with short, strong, sharp spines; there are two longer spines at the base of each leaf petiole. The leaves appear alternately. The edible tubers develop near the crown of the plant much the same as sweet potatoes. They are oval and vary up to 8 inches in length and 2½ inches in diameter. As they are small and not easily injured, these roots can usually be kept longer after being harvested than the large-rooted kinds. They are smooth, dark grayish brown, and at a distance of a few feet are likely to be mistaken for Irish potatoes. The skin is very thin and tough and may, after being broken, be pulled off in strips resembling thin pieces of cherry bark. The interior of the tuber is white, brittle, and firm and practically free from fiber when not allowed to remain too long in the soil; it is over 23 per cent starch. However, tubers which are left in the soil until late in the winter sometimes have a few long and rather strong, longitudinal fibers. When cooked the tubers are fine-grained, tender, and sweeter in flavor than most other varieties.

Since the small yams develop in the surface soil and are not hindered by a compact subsoil, the *Potato* variety thrives best in rich soil and better than most other varieties in clays. It yields poorly in sandy soil and in compact soils produces angular or flattened tubers.

From experiments made in planting at different distances apart it is believed that 3 by 3 feet will give the best results. The variety grows well on ridges or on level land where the drainage is good and the soil is loosened to a good depth. (Adapted from *C. F. Kinman* in *Bulletin 27, Porto Rico Agricultural Experiment Station, p. 13.*)

54976. FRAGARIA sp. Rosaceæ. **Strawberry.**

From Irapuato, Guanajuato, Mexico. Plants presented by Luis Kan, through Arthur Stockdale, Mexico City. Received May 8, 1922.

"Irapuato is famous throughout Mexico for its strawberries, which supply the markets of Mexico City and many other towns of the highlands. Terry's 'Mexico' says: 'The rich soil of the environing country is favorable to the

growth of strawberries (*fresas*) which are on sale throughout the year. A score or more of venders frequent the railway station and offer the berries in small baskets. The best berries are always carefully arranged on the top; the lower layers are apt to be small, if not decayed,' which shows that the Mexicans are not far behind their northern brethren in the matter of preparing their wares for sale. The elevation of Irapuato is 5,800 feet, the climate rather cool, subtropical. I have not been able to learn the history of the Irapuato strawberry fields; probably the first plants were brought here by the Spaniards in relatively recent times and are of European derivation. Only one variety seems to be grown; this is a rather small berry of excellent flavor. It is introduced into the United States for study by our strawberry breeders and for possible use in producing new forms by crossing." (*Wilson Popenoe.*)

54977 and 54978. CERATONIA SILIQUA L. Cæsalpiniaceæ. **Carob.**

From Valencia, Spain. Pods presented by J. D. Wright. Received May 4, 1922. Quoted notes by Mr. Wright unless otherwise specified.

"Carob pods obtained from 'Masia de Mompo,' the estate of Sr. Pelegrin Contell, near Valencia, Spain, March 29, 1922."

54977. "*Matalafera.* Pods of this quality are borne by Sr. Contell's best trees, including his big tree 'El Capitan.'"

54978. "*Roches.* The pods of this variety are very sweet, but are not borne as abundantly as are those of the *Matalafera.*"

54979. TRIFOLIUM REPENS L. Fabaceæ. **White clover.**

From Milan, Italy. Seeds purchased from Fratelli Ingegnoli. Received April 5, 1922.

"*Ladino giant white clover.* A forage plant of the first order, which will grow in any soil capable of being irrigated. It lives for several years if new seeds are sown occasionally. Four cuttings may be obtained, and it makes better hay than other forage plants; it is the best for fattening stock, and also tends to increase the production of milk." (*Fratelli Ingegnoli, Catalogue, 1922.*)

54980. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Florence, Italy. Seeds obtained through W. Roderick Dorsey, American consul. Received April 5, 1922.

"Medium red-clover seed produced in the vicinity of Bologna, Italy." (*Dorsey.*)

Introduced for experimental work by specialists of the Department of Agriculture.

54981. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From Cambridge, England. Tubers presented by Prof. R. H. Biffen, School of Agriculture. Received April 7, 1922.

"*Edgecote Purple.* This variety is introduced for the breeding experiments being conducted by J. W. Lesley at Mills College in California. It bears pollen quite freely, and while it is susceptible to the wart disease, it appears to be resistant to the mosaic and leaf-curl diseases. It is also known as the *Wiltshire* variety." (*William Stuart.*)

54982. NYMPHAEA sp. Nymphæaceæ. **Water lily.**

From Livingston, Guatemala. Plant purchased from Louis Bull, United Fruit Co., through Harry Johnson, Hynes, Calif. Received April 11, 1922.

"This grows in the quiet bays near Jocolo, Izabal, Guatemala, and in general habit is similar to the *gracilis* type. The leaves have sinuate margins and red purple lower surfaces. The white, sweet-scented, diurnal flowers are produced in abundance throughout the year." (*Johnson.*)

54983. DIOSCOREA ALATA L. Dioscoreaceæ. **Greater yam.**

From Trinidad, British West Indies. Tubers presented by Claude Connell, through J. B. Rorer, Board of Agriculture, Port of Spain. Received April 20, 1918, and grown at the Plant Introduction Garden, Brooksville, Fla. Numbered April, 1922.

"This is an unidentified variety of yam from a mixed collection of varieties recorded under S. P. I. No. 45990. The individual tubers of this yam are club-shaped to cylindrical, and thus far in Florida have not much exceeded 4 pounds in weight. They remain perfectly white when cooked and are mealy and of very delicate flavor." (*R. A. Young.*)

54984 to 54987.

From Honolulu, Hawaii. Presented by Dr. H. L. Lyon, in charge, Department of Botany and Forestry, Experiment Station of the Hawaiian Sugar-Planters' Association. Received April 7, 1922. Quoted notes by Doctor Lyon unless otherwise stated.

54984. CASSIA NODOSA Buch.-Ham. Cæsalpiniaceæ.

"Seeds collected in Honolulu."

Pink-and-white shower. This magnificent flowering tree is one of the most commonly cultivated ornamental plants in Honolulu, where it is much used for street planting. It is a moderate-sized deciduous tree, with long drooping branches and glossy leaves; during May and June it bears a profusion of beautiful, bright-pink, rose-scented flowers in dense clusters on long stalks. It is native from the eastern Himalayas to the Malay Islands and the Philippines. (Adapted from *Rock, Ornamental Trees of Hawaii, p. 106.*)

For previous introduction, see S. P. I. No. 52797.

54985. KLEINHOVIA HOSPITA L. Sterculiaceæ.

"Seeds collected in Honolulu."

A handsome tree 25 to 45 feet or more in height, native to southern India and the East Indies, with heart-shaped leaves about 4 inches long and wide. The flowering panicles are large and full and bear small rose-colored flowers; the inflated papery pods are about an inch long. The tree thrives well in low moist places and is quite suitable for planting along avenues, for which purpose it is used considerably in Calcutta. (Adapted from *Rock, Ornamental Trees of Hawaii, p. 155.*)

54986. PINANGA INSIGNIS Beccari. Phœnicaceæ. **Palm.**

"Seeds collected in the Philippines by F. X. Williams."

A rather small palm with a slender, smooth trunk about 6 inches in diameter, very graceful feathery leaves, and oval fruits 2 inches in length. The seeds are occasionally used as a substitute for betel nuts in preparing "búyo," the mixture of leaves of *Piper betle*, lime, and betel nuts, which, when chewed, colors the saliva a characteristic red and is held to be a tonic and general stimulant. (Adapted from *Brown and Merrill, Philippine Palms and Palm Products, pp. 20, 112, and 117.*)

For previous introduction, see S. P. I. No. 37607.

54987. UVARIA sp. Annonaceæ.

"Seeds collected in the Philippines by F. X. Williams."

54988 to 54990.

From Matania el Saff, Egypt. Seeds presented by A. Bircher, director, Middle Egypt Botanic Station. Received April 7, 1922. Quoted notes by Mr. Bircher.

54988. BARYXYLUM AFRICANUM (Sond.) Pierre. Cæsalpiniaceæ.
(*Peltophorum africanum* Sond.)

"A handsome evergreen tree with feathery leaves and yellow flowers."

For previous introduction, see S. P. I. No. 50125.

54988 to 54990—Continued.

54989. DIOSPYROS sp. Diospyraceæ. **Persimmon.**

"This evergreen tree grows well in Egypt, bearing heavy crops of fruits the size of apples, with dark-brown, sweet flesh."

54990. VANGUERIA INFAUSTA Burchell. Rubiaceæ.

"A small tree with sessile woolly leaves and bearing clusters of fruits known as 'Mispel' in South Africa. It resembles *Vangueria edulis*, but is better adapted to a continental climate than the latter, which is a native of Madagascar."

A tree 6 to 7 feet high with dense cymes of greenish flowers and edible globular fruits about an inch in diameter, known as "wild medlars" to the colonists in South Africa. (Adapted from *Sim, Forest Flora of the Cape of Good Hope, p. 243.*)

54991. PYRACANTHA CRENULATA YUNNANENSIS Vilm. Malaceæ.

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. Received April 7, 1922.

"A new variety received from Yunnan, China, by Maurice L. Vilmorin; it differs from the type in its greater vigor, longer spines, and less dentate leaves. The shrub attains a height of 1 to 3 meters (3 to 10 feet). As compared with the type, the fruits are a brighter coral red and are smaller but much more abundant; they hang on the shrub until January." (*Vilmorin-Andrieux & Co., 1920–1922 catalogue.*)

54992. CARICA PAPAYA L. Papayaceæ. **Papaya.**

From Progreso, Yucatan, Mexico. Seeds presented by O. Gaylord Marsh, American consul. Received April 7, 1922.

"Dr. George F. Gaumer, an American scientist at Izamal, Yucatan, has furnished the following information regarding this variety of the papaya: 'The Maya name is *Chacalhauzput* and the English name *mammey* papaya, the latter name being derived from the fact that the edible part of the fruit is of the same color as that of the *mammey* [*Mammea americana* L.]. The fruit is from 10 to 12 inches long and 3 to 6 inches in diameter, with flesh of a very fine flavor. The milky juice of the unripe fruits contains a large amount of papain, an excellent digestive." (*Marsh.*)

For previous introduction, see S. P. I. No. 54330.

54993 and 54994. TRIFOLIUM REPENS L. Fabaceæ. **White clover.**

From Aarhus, Denmark. Seeds presented by S. Sörensen, agricultural attaché, Danish Legation, Washington, D. C. Received April 11, 1922. Quoted notes by Mr. Sörensen.

"Two samples of our best strains of white clover, sent to me by a seed dealer, Fr. Drejer, from Aarhus, Denmark."

54993. "*Norso* (No. 348)."

54994. "*Stryno Hvidklöver* (No. 660)."

54995. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

From Kengtung, Burma. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received April 4, 1922.

"(Kengtung, southeastern Shan States. February 1, 1922.) This variety is much cultivated; the green pods are eaten like string beans and the mature ones like Lima beans. These are greatly relished by the Shan people, as well as by Europeans. The seeds are planted in May, and mature pods are obtained in the cold season." (*Rock.*)

54996. FRAGARIA VESCA SEMPERFLORENS (Duch.) Seringe. Rosaceæ. **Strawberry.**

From Edinburgh, Scotland. Seeds presented by Prof. Isaac Bayley Balfour. Royal Botanic Garden. Received April 14, 1922.

This variety differs from the type in the greater size of all its parts, the fruit in particular, and especially in its habit of producing flowers and fruit continuously throughout the summer. In its red color and delicate flavor the fruit is quite similar to that of the type. (Adapted from *Robinson, The Vegetable Garden, p. 673.*)

54997. PYRUS sp. Malaceæ. **Pear.**

From Chefoo, China. Presented by A. Sugden. Received April 4, 1922.

Pear seeds from Chefoo, China, which are to be grown for use as stock plants for cultivated varieties of apples and pears.

54998. PYRUS PASHIA Buch.-Ham. Malaceæ. **Pear.**

From Kengtung, Burma. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received April 4, 1922.

"(No. 2253. Kengtung, Burma. February 6, 1922.) A large tree about 50 feet in height with a trunk about 2 feet in diameter, found in a bamboo grove on the plains of Kengtung two stages from the Chinese border, at an altitude of about 3,000 feet. The flowers of this variety are pure white without the pink center seen in those found on the slopes of Loi Mwe southeast of Kentung, and the tree is an object of great beauty. The natives let the fruits get black on the tree, in which state they are sweet and are made into jam. The fruits of this variety are larger than usual. The native name is *Mai Kaw Ki Kai.* The sand pears of Yunnan are grafted on this species by the natives, according to a priest of the temple of Wat Ban Sao." (*Rock.*)

54999. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Jesi, Department of Marches, Italy. Seeds purchased through Francesco Archibugi, New York, N. Y. Received April 14, 1922.

Introduced for comparison with American-grown seed.

55000. ARALIA CACHEMIRICA Decaisne. Araliaceæ.

From Stockholm, Sweden. Seeds presented by Dr. Robert E. Fries, director, Botanic Garden. Received April 15, 1922.

This Himalayan species of Aralia is introduced for comparison and breeding experiments with the udo (*Aralia cordata*). It is a lax shrub, 5 to 10 feet in height, with elongated flower panicles a foot in length.

For previous introduction, see S. P. I. No. 52788.

55001. GIRARDINIA PALMATA Gaud. Urticaceæ.

From Sibpur, near Calcutta, India. Seeds presented by Lieut. Col. A. T. Gage, director, Royal Botanic Garden. Received April 15, 1922.

A tall, stout, erect, tufted plant, 4 to 6 feet in height, growing commonly in the temperate and subtropical regions of the Himalayas, where it ascends to 5,000 feet above the sea. It is generally known as the "Nilghiri nettle" and is of considerable importance in its native country because of the fiber obtained from its stalks. This fiber is very long, white, soft, and silky and is used for making fine fabrics and for mixing with wool. While the plant is described as an annual, it has proved, under cultivation, to be a perennial; the young shoots are cut down twice a year for their fiber. The leaves of this species are used as a vegetable among the hills of the Northwest Provinces. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 3, p. 500.*)

55002. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Riga, Russia. Purchased through John P. Hurley, American consul. Received April 14, 1922.

"This seed originated in the former Province of Kurland, but was grown in the district of Doblen, about 40 miles southwest of Riga." (*Hurley.*)

Introduced for comparison with American-grown varieties.

55003. DIOSCOREA ALATA L. Dioscoreaceæ. **Greater yam.**

From Natal, Rio Grande do Norte, Brazil. Tubers presented by E. C. Green. Received April 12, 1922.

"These tubers weigh only a few ounces each and are presumably much below the average. The flesh darkens a little when cooked, but is mealy and of good flavor." (*R. A. Young.*)

55004 to 55024.

From Nishigahara, Tokyo, Japan. Seeds presented by H. Ando, director, Imperial Agricultural Experiment Station. Received April 15, 1922.

55004 to 55023. ECHINOCHLOA CRUSGALLI FRUMENTACEA Link. Poaceæ. **Barnyard millet.**

A collection of native varieties of barnyard millets introduced for cultural and breeding experiments.

55004. *Chonakubi.*
55005. *Chosen.*
55006. *Dango.*
55007. *Esashi-shiro.*
55008. *Futagomochi.*
55009. *Gamakashira.*
55010. *Hanamaki.*
55011. *Hida.*
55012. *Hitokara.*
55013. *Kekanjo.*
55014. *Kinshu.*
55015. *Kurohie.*
55016. *Manshu.*
55017. *Mochi-hie.*
55018. *Hanamaki-kuro.*
55019. *Nigiri.*
55020. *Numakunai.*
55021. *Otsu.*
55022. *Yamanome 1.*
55023. *Yamanome 2.*

55024. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

"Timothy seeds produced in Hokkaido." (*Ando.*)

Locally grown timothy introduced for breeding investigations.

55025 and 55026.

From Los Banos, Philippine Islands. Seeds presented by J. E. Higgins, College of Agriculture. Received April 15, 1922.

55025. CASSIA SIAMEA Lam. Cæsalpiniaceæ. **Kassod tree.**

A medium-sized or sometimes a large tree with gray, nearly smooth bark and papery, glabrous leaflets. The small yellow flowers are borne in large pyramidal terminal panicles. The tree is probably native to Burma and is cultivated throughout India and many tropical countries for its hard heavy wood, which is very durable. The heartwood is dark brown to nearly black, in stripes of dark and light; it is used for mallets, walking sticks, for building, and for fuel. (Adapted from *Rock, Leguminous Plants of Hawaii, p. 81.*)

For previous introduction, see S. P. I. No. 54924.

55026. CASSIA TIMORIENSIS DC. Cæsalpiniaceæ.

A rather low tree with slender, downy branches, pale-green leaves up to 9 inches in length, bright-yellow flowers, and thin, glossy, flexible pods sometimes 6 inches long. The tree is distributed throughout the Malay Archipelago and the Philippines. (Adapted from *Hooker, Flora of British India, vol. 2, p. 265.*)

55027. PYRUS CALLERYANA Decaisne. Malaceæ. **Pear.**

From Nanking, China. Seeds purchased from J. L. Buck, acting dean, College of Agriculture, University of Nanking. Received April 15, 1922.

A wild pear from the mountains of western China, where it grows at altitudes of 1,000 to 1,500 meters (3,300 to 5,000 feet). This pear maintains a vigorous and healthy condition under the most trying situations and may prove to be a very valuable blight-resistant stock.

For previous introduction, see S. P. I. No. 49097.

55028. PASSIFLORA MALIFORMIS L. Passifloraceæ.

From Cartagena, Colombia. Seeds presented by H. C. Kluge. Received April 17, 1922.

"The flower of this vine is very beautiful, and the fruit is edible." (*Kluge.*)

55029. AELUROPUS REPENS (Desf.) Parl. Poaceæ. **Grass.**

From Algiers, Algeria. Seeds presented by Dr. L. Trabut, director, Service Botanique. Received April 17, 1922.

"Found at very salty places in the Sahara." (*Trabut.*)

A low, much-branched, rigid, perennial grass from the Mediterranean countries. It roots at the nodes and appears to be partial to sandy places, even close to salt water. (Adapted from *Muschler, Manual Flora of Egypt, vol. 1, p. 129.*)

55030. CITRUS sp. Rutaceæ.

From Holguin, Cuba. Seeds presented by Thomas R. Towns. Received April 11, 1922.

"I have used this shaddock, which is the nonedible white variety, as a stock for 20 years and would be lost without it. For grapefruit it is inclined to gum rather more than the sour orange or rough lemon, but my 10-year-old tangerines, worked on this stock, have 2,500 fruits on some of the trees, and the fruits are fine grained and of good commercial size. The Washington Navel on this stock is also very prolific and bears a full crop every year, and I have had equal success with other round oranges like the King, Valencia, Pineapple, and Lue Gim Gong." (*Towns.*)

55031 to 55039. AVENA SATIVA L. Poaceæ. **Oats.**

From Helsingfors, Finland. Seeds presented by Leslie A. Davis, American consul, through E. G. Montgomery, United States Department of Commerce. Received April 15, 1922. Quoted notes by Mr. Davis.

55031. "*Esa* (0644). A white oat."

55032. "*Jalostettu maatiais* (0144). This variety was obtained by crossing the Kuopio 091 variety with the Guldregn variety. Its kernel is very dark brown, resembling that of the native stock. It has simple requirements and grows here just as well as native stock. The panicle is large and beautiful. The straw is of average length, somewhat better than that of native stock, but not so strong as that of the Guldregn variety. It ripens at the same time as central Finnish native stock, but five days earlier than the Guldregn variety. During experiments of many years it has often given a better crop than the Guldregn variety and a considerably better one than native stocks, with which it has been compared."

55033. "*Kultasade* (*Guldregn*). This variety from southern Finland thrives in northern Finland only in high warm places."

55034. "*Nopsa* (0206). This is a cross between the Norbotten and Ligovo oat varieties. It has a large black chaffy kernel of which the hull forms a considerable percentage. The panicle is not thick and the stalk is strong. It is very early, ripening two weeks before the Guldregn oat. The crop is good, considering its early ripening, but

55031 to 55039—Continued.

it can not compete with later varieties, such as the Guldregn. It does not appear to thrive well in dry places, but it yields well in swampy lands. It is especially suitable for cultivation on swampy lands on account of its maturing so early and because of its strong stalks. This oat must be sown profusely, owing to the large size of its kernel."

55035. "*Osmo 1* (0537). This variety was obtained by crossing Kuopio 091 with the Guldregn variety. The kernel is full, dark brown, and of the size of the Guldregn. The panicle is straight and the straw strong. The straw is not quite so hard as that of the Guldregn, but stands up about as well. It is a little earlier than the first variety here mentioned. It ripens a week before the Guldregn, so that it can well be cultivated in central and northern Finland. It also grows well in swamps."

55036. "*Osmo 2*."

55037. "*Tuotto* (101). This variety comes from the foreign Clydesdale oat. It has a large, full kernel. The color of the kernel, however, is not satisfactory, since it is brownish gray. The panicle is not thick, but is stiff, and the stalk is somewhat short and strong. The *Tuotto* variety is a late one and ripens four or five days later than the Guldregn variety. It gives good crops and has given better ones than the Guldregn and Veikko varieties. It can be grown profitably only in southern Finland."

55038. "*Veikko* (052). This variety has descended in a direct line from the Pfiffelbacher variety. Its kernel is large, white, and full and has quite a thin hull. Its panicle is straight, and its stalk is strong and of average length. It ripens at the same time as the Guldregn and in experiments has sometimes given better and sometimes poorer crops than the latter, so that it may be considered of about the same value as the Guldregn. It requires perhaps a somewhat better quality of soil than the Guldregn."

55039. "*Voitto* (*Seger*). This variety from southern Finland thrives in northern Finland only in high warm places."

55040. ERYTHRINA POEPPIGIANA (Walp.) O. F. Cook. Fabaceæ.
(*E. micropteryx* Poepp.)

From Mayaguez, Porto Rico. Seeds presented by T. B. McClelland, horticulturist, Porto Rico Agricultural Experiment Station. Received April 17, 1922.

An ornamental red-flowered leguminous tree, 40 to 50 feet in height and covered with short, conical spines. It is a native of the lower Andes of Peru, but is cultivated as a shade tree on coffee plantations in Porto Rico, where it is known as *bucare* and also as *palo de boyo*. (Adapted from *Cook and Collins, Economic Plants of Porto Rico, Contributions from the National Herbarium, vol. 8, p. 139.*)

For previous introduction, see S. P. I. No. 43049.

55041. SABINEA CARINALIS Griseb. Fabaceæ.

From Dominica, British West Indies. Seeds presented by Joseph Jones, curator, Botanic Gardens. Received April 19, 1922.

"This tree is known locally as *Bois Charibq* and is one of the most showy of our native plants. It is a very fine flowering tree, and I have seen nothing in the Tropics to surpass it as a mass of color. If grown on fairly good land, it will not make a good show; but if planted on a dry, rocky hillside, where it will be scorched by the sun for a period of three or four months each year, it makes a marvelous display of flowers." (*Jones.*)

"Mr. Jones's description of the marvelous color of the *Bois Charibe* and of the rocky hillsides where it grew attracted my attention at once, and I planted a few young seedlings on a dry coral reef in front of my house at Coconut Grove, Fla. They have grown unusually well, and during the first week of

March last year one of them flowered. I have never seen a more beautiful scarlet flower, and Mr. Jones says he has seen nothing in the Tropics to surpass it as a mass of color. The chances seem good that in the *Bois Charibe* we have a small tree which is going to add splashes of red color to the landscapes of southern Florida and one which will thrive on the dry rocky ledges." (*David Fairchild.*)

For previous introduction, see S. P. I. No. 46026.

55042. COFFEA LAURENTII Wildem. Rubiaceæ. **Coffee.**
(*C. robusta* Hort.)

From Kingston, Jamaica. Seeds presented by W. S. Goodman, acting superintendent, Hope Gardens. Received April 17, 1922.

This species, which is native to the Belgian Congo, is introduced for the use of specialists in the Department of Agriculture. It is commonly known as "robusta" coffee.

For previous introduction, see S. P. I. No. 51481.

55043 and 55044.

From Tangier, Morocco. Seeds presented by Jules Goffart, Société d'Horticulture. Received April 17, 1922.

55043. LIMONIUM BRASSICAEFOLIUM × IMBRICATUM. Plumbaginaceæ.
(*Statice brassicaefolium* × *imbricatum.*)

This is a hybrid between *Limonium brassicaefolium*, which has flowers with yellowish white corollas and smooth purple calyxes, and *L. imbricatum*, which has flowers with yellowish white corollas and rather hairy calyxes. Both of these species are shrubby plants about a foot and a half in height, with more or less velvety lobed leaves and winged branches, and both are natives of the Canary Islands.

55044. LIMONIUM FRUTICANS (Webb) Kuntze. Plumbaginaceæ.
(*Statice fruticans* Webb.)

An ornamental shrubby plant, native to the Canary Islands, with rigid, much-branched flower stalks about 2 feet in height, rising from a loose rosette of oval, crisply wrinkled leaves. It bears large flat clusters of bicolored flowers; the snowy white corollas and bright-violet calyxes are made more vivid by the small red bracts and the bright-green wings of the flower stalks. (Adapted from *Flore des Serres et des Jardins de l'Europe, vol. 4, p. 525.*)

For previous introduction, see S. P. I. No. 51148.

55045. ZEA MAYS L. Poaceæ. **Corn.**

From Doi Chang, Siam. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received April 4, 1922.

"(Doi Chang, near Chiengmai, Siam. January 10, 1922.) This corn was found at an altitude of 4,500 feet on Doi Chang, the Elephant Mountain; it was grown by the Miao tribe, a jungle people who inhabit the high mountains from northern Siam northward to the Province of Kweichow, China. They are a very primitive people of Chinese origin and do not eat rice but use corn exclusively." (*Rock.*)

55046. BOUEA OPPOSITIFOLIA (Roxb.) Meissn. Anacardiaceæ.
(*B. burmanica* Griffith.)

From Bangkok, Siam. Seeds presented by Y. S. Sanitwongse. Received May 4, 1922.

"The fruit of the *maprang* is of very inferior quality everywhere except at a certain locality north of Bangkok." (*Sanitwongse.*)

An evergreen tree of moderate height, with hard, gray wood which is very durable. It is a relative of the mango and is often cultivated for its edible fruits. It is native to Burma and the Andaman Islands. (Adapted from *Gamble, Manual of Indian Timbers, p. 108.*)

55047 and 55048. Zea mays L. Poaceæ. Corn.

From Prague, Czechoslovakia. Seeds presented by Basil Benzin. Received April 19, 1922. Quoted notes by Mr. Benzin.

Native Czechoslovakian varieties of corn, introduced for cultural and breeding experiments.

55047. "*Bankutka.* A flint variety derived from dent corn by selection. 1917–1921, Levice, Czechoslovakia."

55048. "*Florentinka.* An extra early variety of flint corn. Levice, Czechoslovakia."

55049. Cassia sp. Cæsalpiniaceæ.

From Szemao, Yunnan, China. Seed collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received May 4, 1922.

"(No. 2827. Szemao, Yunnan. March 11, 1922.) A deciduous tree 40 to 50 feet in height, found in the foothills of Szemao at an altitude of 5,000 feet. During March the tree is one mass of large, deep-pink flowers which are 2 inches wide and borne in short racemes all along the branches. It is a most striking tree and can be seen from quite a distance. It is very different from *Cassia nodosa*, which is evergreen, and from *C. bakeriana*, which occurs in northern Siam." (*Rock.*)

55050. Eranthemum purpureum Hort. Acanthaceæ.

From Manila, Philippine Islands. Cuttings presented by P. J. Wester, agricultural adviser, Bureau of Agriculture. Received April 19, 1922.

"A plant with variegated, mostly purplish foliage, grown on the Moro graves in Lanao. The flowers are whitish and inconspicuous. It could probably be used as a bedding plant as far north as Washington or possibly New York." (*Wester.*)

"No place of publication has been found. It may be *Odontonema nitidum* Kuntze. To be grown for identification." (*H. C. Skeels.*)

55051 and 55052.

From Cuzco, Peru. Seeds presented by Prof. Fortunato L. Herrera. Received April 17, 1922.

55051. Chenopodium quinoa Willd. Chenopodiaceæ Quinoa.

"One of the plants cultivated by the native inhabitants of the highlands of Peru and Bolivia is a species of Chenopodium (*C. quinoa*), and so far as foliage is concerned it is not very unlike our ordinary 'goosefoot' in general appearance. Its seeds, however, are white, or nearly so, and fully three times as large as those of *C. album*. In pre-Columbian times this plant was one of the main foods of the Indians, evidently ranking with the potato and corn in this respect. None of the Old World cereals being known before the discovery, it was only natural that the cultivation of this plant should have extended over a considerable area. In addition to Peru and Bolivia it was probably grown in some parts of Argentina and is known with certainty to have been cultivated in Chile; in fact, there even appears to have been an Araucanian or Mapuche name for it. Doubtless its cultivation at the present time is less extensive than formerly, due in part to the diminished Indian population and in part to an apparent ignorance or indifference on the part of the white population to its real merits as a food. At present it is probably most commonly grown on the Titicaca plateau. It is said to yield abundantly, though it does not seem to have occurred to anyone to measure the yield of a given area. In late April and May some of the fields are red with compact panicles, for this seems the only part of the plant visible from a short distance. Other fields have a greenish cast, there being two or possibly more varieties. On the island of Chiloe, southern Chile, the plant grows taller than any seen about Lake Titicaca, and the foliage is more abundant, though

55051 and 55052—Continued.

whether the latter condition is due to the difference in season or to the lower altitude and more abundant rainfall is uncertain. The grain is used by the Indians in the same manner as rice, being put in soups and made into porridge. It appeals to a North American primarily as a breakfast food and should rank with oatmeal and some of the better wheat preparations. It may be cooked and served in a manner similar to oatmeal, but it becomes even more appetizing if spread out in a tray about an inch deep after steaming and then browned in the oven." (*W. F. Wight.*)

For previous introduction, see S. P. I. No. 46658.

55052. LUPINUS sp. Fabaceæ. **Lupine.**

"*Tarhui.* The seeds are consumed in large quantities in this locality and are of great importance as a foodstuff, having been used since the time of the conquest." (*Herrera.*)

55053 to 55056.

From Chefoo, Shantung, China. Budwood presented by A. Sugden. Received April 17, 1922. Quoted notes by Mrs. Myers.
Sugden.

55053. MALUS sp. Malaceæ. **Crab apple.**

"A white-fruited crab apple."

55054. MALUS sp. Malaceæ. **Crab apple.**

"A red-fruited crab apple."

55055. PYRUS sp. Malaceæ. **Pear.**

"A wild pear."

55056. ZIZIPHUS JUJUBA Mill. Rhamnaceæ. **Jujube.**
(*Z. sativa* Gaertn.)

"The dragon's-claw 'date.'"

An ornamental variety of the jujube with gnarled, twisted branches. It is said to be quite rare in China.

For previous introduction, see S. P. I. No. 22914.

55057 to 55064. HIBISCUS spp. Malvaceæ. **Hibiscus.**

From Honolulu, Hawaii. Seeds presented by Mrs. J. Rappe Myers. Received April 17, 1922. Quoted notes by Mrs. Myers.

"Collected in Honolulu, March 14, 1922."

55057. HIBISCUS sp.

"A very choice mixed collection."

55058. HIBISCUS sp.

"Apricot colored, single."

55059. HIBISCUS sp.

"Single, copper shade, very choice, from Gerrit P. Wilder's garden."

55060. HIBISCUS sp.

"A delicate straw-colored single variety from the Oahu Country Club."

55061. HIBISCUS sp.

"Single, creamy pink, shading to a very dark center."

55062. HIBISCUS sp.

"A beautiful, large, soft-pink single variety."

55057 to 55064—Continued.

55063. HIBISCUS sp.

"A large single white variety from Robbins B. Anderson. This plant produced more and larger flowers than any other white variety on the island."

55064. HIBISCUS sp.

"A beautiful single yellow variety from the experiment station."

55065 to 55067.

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. Received April 27, 1922.

55065. BASELLA RUBRA L. Basellaceæ. **Malabar nightshade.**

Common white variety. An East Indian plant with creeping stems up to 6 feet in length and oval or heart-shaped, fleshy green leaves. These leaves, which may be eaten like spinach, are abundantly produced throughout the summer, growing in greater profusion as the weather becomes warmer. The plant is cultivated as an annual, the seeds being sown in early spring and the seedlings planted out late in May. (Adapted from *Robinson, The Vegetable Garden, p. 451.*)

For previous introduction, see S. P. I. No. 2006.

The following grasses are introduced for forage-crop experiments:

55066. FESTUCA HETEROPHYLLA Lam. Poaceæ. **Fescue.**

"This European grass is used in mixtures for sterile or sandy soil, especially in mixtures for lawns; the stem blades are flat." (*A. S. Hitchcock.*)

55067. PHALARIS BULBOSA Jusl. Poaceæ. **Grass.**

A perennial tufted grass whose roots penetrate the soil to a depth of nearly 3 feet. It is a native of the Mediterranean countries, but is now cultivated in New South Wales, where it has been found to endure dry conditions remarkably well. It will stand a considerable amount of pasturing; it also makes excellent hay if cut as soon as the flower heads begin to appear. (Adapted from *Agricultural Gazette of New South Wales, vol. 28, p. 715.*)

For previous introduction, see S. P. I. No. 53241.

55068. MANISURIS EXALTATA (L. f.) Kuntze. Poaceæ. Grass.

(*Rottboellia exaltata* L. f.)

From Salisbury, Rhodesia. Seeds presented by H. G. Mundy, chief agriculturist and botanist, Department of Agriculture. Received April 24, 1922.

"*Kokoma grass.* This grass, which is a native of Rhodesia, is an extremely vigorous, free-seeding, leafy annual. It hardly withstands drought as well as Sudan grass, but gives a considerably larger yield of fodder. Owing to the freedom with which the seeds are shed it is inclined to volunteer very freely, and in rich, low-lying, arable land it may become a troublesome weed. The rather harsh, stringing hairs on the lower culms are an objection, but not a very serious one." (*Mundy.*)

For previous introduction, see S. P. I. No. 46983.

55069 and 55070. SOJA MAX (L.) Piper. Fabaceæ. Soy bean.

(*Glycine hispida* Maxim.)

From Omagari, Akita-Ken, Japan. Seeds presented by Isabura Nagai, director of substation, Rikuu Branch, Agricultural Experiment Station. Received April 29, 1922.

"It has been our experience that the smooth, or 'Hadaka,' varieties of soy beans from Japan do not shatter their seed nearly so easily as the hairy sorts." (*W. J. Morse.*)

"The pods of the first variety are smooth and of the second variety slightly hairy. Both varieties were grown at our experiment station." (*Nagai.*)

55069. *Hadaka No. 3.* **55070.** *Hadaka No. 260.*

55071 to 55098.

From Paris, France. Seeds presented by Vilmorin-Andrieux & Co. Received April 17, 1922.

55071 to 55075. BERBERIS spp. Berberidaceæ. **Barberry.**

55071. BERBERIS AGGREGATA PRATTII C. Schneid.

(Wilson No. 1300.)

A hardy shrub 6 to 10 feet in height, with slender, 3-parted spines, oval leaves, narrow panicles of yellow flowers, and egg-shaped salmon-red fruits about one-fourth of an inch in length. It is a native of western China and grows very freely under cultivation at Kew, England. (Adapted from *Curtis's Botanical Magazine, pl. 8549.*)

For previous introduction, see S. P. I. No. 44527.

55072. BERBERIS DIELSIANA Fedde.

"(Purdom No. 543.) A spreading, loosely branched, Chinese shrub often 10 feet high, with elliptic leaves that are whitish beneath. The beauty of the red fruits is accentuated by the bronze color of the leaves in the fall." (*Skeels.*)

For previous introduction, see S. P. I. No. 54066.

55073. BERBERIS POIRETI C. Schneid.

(Purdom No. 35.) Forma *weichangensis.* A form of the above species from Weichang, Chihli, China; it differs slightly from the type in the size of the bracts and in spine characters.

55074. BERBERIS sp.

(M. Vilmorin No. 4775.)

55075. BERBERIS sp.

(Wilson No. 135.)

55076. BETULA MEDWEDIEWI Regel. Betulaceæ. **Birch.**

A lofty tree, native to Mount Somlia, Transcaucasia, where it is found in forest borders at an altitude of 6,800 feet. The papery, oval leaves, smooth and olive green on the upper surface, are paler below. (Adapted from *Gartenflora, vol. 36, p. 383.*)

For previous introduction, see S. P. I. No. 52933.

55077. BUDDLEIA JAPONICA Hemsl. Loganiaceæ.

A deciduous shrub 3 to 5 feet in height, sparsely branched and of an open habit. The very narrow dark-green leaves are up to 8 inches in length, and the pale-lilac flowers are densely crowded in terminal branched panicles. This shrub is a native of Japan and is rather striking in autumn with its long, dense, drooping panicles of fruit. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 272.*)

55078. CALLICARPA GIRALDIANA Hesse. Verbenaceæ.

(Wilson No. 439.)

An ornamental shrub from western China, with membranous bright-green dentate leaves and many-flowered cymes of purple flowers followed by dense clusters of round violet-purple fruits. (Adapted from *Sargent, Plantae Wilsonianae, vol. 3, p. 366.*)

For previous introduction, see S. P. I. No. 44076.

55079. CASTANEA SATIVA Mill. Fagaceæ. **Chestnut.**

Variety *heterophylla.* A form with leaves of various shapes.

55080 to 55086. COTONEASTER spp. Malaceæ.

55080. COTONEASTER ADPRESSA Bois.

A dwarf Cotoneaster from China which does not exceed 10 inches in height, but forms a clump several feet in diameter, with the

55071 to 55098—Continued.

stems rooting easily where they touch the ground. It has solitary flowers with pink-tipped petals and bright-red fruits. (Adapted from *Vilmorin and Bois, Fruticetum Vilmorinianum, p. 116.*)

For previous introduction, see S. P. I. No. 27407.

55081. COTONEASTER MOUPINENSIS Franch.

The common cotoneaster in the thickets and margins of woods throughout western Szechwan at altitudes of 4,000 to 7,500 feet. It is 6 to 15 feet high, with white flowers and jet-black fruits. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 163.*)

For previous introduction, see S. P. I. No. 53688.

55082. COTONEASTER MULTIFLORA Bunge.

A deciduous shrub or small tree 10 to 12 feet high, with slender, arching branches, papery leaves, branched clusters of white flowers, and roundish red fruits. This elegant cotoneaster is native to the northwestern borders of China and makes a most charming appearance when the branches are wreathed with the abundant flowers in May and June. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 413.*)

For previous introduction, see S. P. I. No. 40168.

55083. COTONEASTER SALICIFOLIA RUGOSA (E. Pritz.) Rehd. and Wils.

"A very handsome Chinese shrub having long pendulous branches covered with much-wrinkled lanceolate leaves which have the undersurface covered with down. The berries are small, globular, and bright scarlet. They are borne in clusters and combined with the autumn tints of the foliage produce a very pretty effect." (*Journal of the Royal Horticultural Society, vol. 38, p. cclii.*)

For previous introduction, see S. P. I. No. 53694.

55084. COTONEASTER sp.

Received as *Cotoneaster myrtiflora*, for which a place of publication has not been found.

55085. COTONEASTER sp.

(M. Vilmorin No. 4690.)

55086. COTONEASTER sp.

(M. Vilmorin No. 5015.)

55087. DEUTZIA SCHNEIDERIANA LAXIFLORA Rehder. Hydrangeaceæ.

(Wilson No. 767.)

A shrub about 6 feet in height from western China. The flowers, nearly half an inch in length, are borne in broadly pyramidal but rather loose clusters. (Adapted from *Gardeners' Chronicle of America, vol. 24, p. 273.*)

For previous introduction, see S. P. I. No. 52640.

55088. DEUTZIA sp. Hydrangeaceæ.

(M. Vilmorin No. 7264.)

55089. LIGUSTRUM DELAVAYANUM Harlot. Oleaceæ. **Privet.**

(Wilson No. 1290.)

This hardy shrub was first discovered by Abbé Delavay in the mountains of Yunnan, China. In habit it is prostrate-spreading, except for a few perfectly upright branches which rise from the center of the shrub to a height of about 10 feet. The shining dark-green foliage, which is remarkably persistent, reminds one of a myrtle and, with the

55071 to 55098—Continued.

white flowers and blue-black fruits, makes this plant a very attractive ornamental. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 601,* and from *Revue Horticole, vol. 73, p. 495.*)

For previous introduction, see S. P. I. No. 49677.

55090. PRUNUS sp. Amygdalaceæ. **Plum.**

Received as *Prunus korolkowii,* for which a place of publication has not been found.

55091. PYRACANTHA sp. Malaceæ.

(M. Vilmorin No. 6257.)

55092. RIBES MEYERI TURKESTANICUM Jancz. Grossulariaceæ.

A shrub 3 to 4 feet in height, native to Turkestan, with blunt-pointed leaves, reddish purple flowers, and deep-purple, shiny, juicy fruits of no pronounced flavor. (Adapted from *E. Janczewski, Monographie des Groseilliers, p. 297.*)

For previous introduction, see S. P. I. No. 32761.

55093. RIBES sp. Grossulariaceæ.

(M. Vilmorin No. 7947.)

55094 and 55095. ROSA OMEIENSIS PTERACANTHA (Franch.) Rehd. and Wils. Rosaceæ. **Rose.**

55094. A shrub 3 to 9 feet tall, with white flowers and red fruits having usually a shorter stalk than in the type. Very common on the wind-swept mountain sides of western Szechwan. (Adapted from *Sargent, Plantae Wilsonianae, vol. 2, p. 332.*)

For previous introduction, see S. P. I. No. 53738.

55095. Variety *fructu rubra.* A bushy rose about 3 feet in height, with large oval prickles, small thickly set leaves, solitary single white flowers, and rather large red fruits. It is native to Yunnan, China. (Adapted from *Vilmorin and Bois, Fruticetum Vilmorinianum, p. 99.*)

55096. SORBARIA ARBOREA SUBTOMENTOSA Rehder. Rosaceæ.

A variety with the lower surfaces of the leaflets densely hairy; similar to the type, but with larger flowers. It is native to western Szechwan, China, where it forms a shrub up to 20 feet in height with rather small white flowers. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 47.*)

55097. SORBARIA sp. Rosaceæ.

Received as *Sorbaria pallasii grandiflora,* for which a place of publication has not been found.

55098. VITIS DAVIDII (Carr.) Foex. Vitaceæ. **Grape.**

A luxuriant climber, native to central China, with the young shoots covered with spiny, somewhat-hooked bristles. The shining dark-green leaves are heart shaped, toothed, and up to 8 inches in width, and the fruits are said to be black, about two-thirds of an inch in diameter, and of pleasant flavor. (Adapted from *Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 667,* under *Vitis armata.*)

For previous introduction, see S. P. I. No. 41877.

55099. GOSSYPIUM sp. Malvaceæ. **Kidney cotton.**

From Yeungkong, Kwangtung, China. Seeds presented by Dr. W. H. Dobson. Received April 18, 1922.

A kidney cotton with fiber of medium length.

55100 to 55104.

From Kisantu, Belgian Congo. Seeds presented by Père J. Gillet, S. J., Jardin d'Essais de Kisantu. Received April 29, 1922.

55100. COFFEA sp. Rubiaceæ. Coffee.

"Coffee-hybrid Le Roy." (*Gillet.*)

55101. MUSA ARNOLDIANA Wildem. Musaceæ. Banana.

The plant grows to a height of 12 to 15 feet without suckering, and the leaves are about 7 feet in length. The inflorescence is short and drooping, and the fruits are nearly 4 inches long. The plant is native to the Belgian Congo. (Adapted from *Faweett, The Banana, p. 278.*)

55102. PIMENTA OFFICINALIS Lindl. Myrtaceæ. Allspice.

A small tree, native to tropical America, whose dried, unripe berries constitute the allspice of commerce. It prefers a hot and rather dry climate, with alluvial, well-drained soil. Jamaica is the source of our supply of allspice at the present time.

For previous introduction, see S. P. I. No. 44824.

55103. PSIDIUM sp. Myrtaceæ.

"A small shrub." (*Gillet.*)

55104. VOANDZEIA SUBTERRANEA (L.) Thouars. Fabaceæ.

A creeping annual leguminous plant which matures its fruits in the same manner as the peanut, whence its common name "groundnut." It is native to tropical Africa and is extensively grown in that continent, as well as in other tropical countries, for its edible seeds.

For previous introduction, see S. P. I. No. 54704.

55105. GARCINIA TINCTORIA (DC.) W. F. Wight. Clusiaceæ.

(*G. xanthochymus* Hook. f.)

From Honolulu, Hawaii. Seeds presented by Gerrit P. Wilder. Received April 4, 1922.

Introduced for testing as a stock for the mangosteen (*Garcinia mangostana* L.).

For previous introduction, see S. P. I. No. 40103.

55106 to 55165. HOLCUS SORGHUM L. Poaceæ. Sorghum.

(*Sorghum vulgare* Pers.)

From Khartum, Anglo-Egyptian Sudan. Seeds presented by W. A. Davie, Director of Agriculture, Sudan Government, through H. N. Vinall, agronomist, Office of Forage-Crop Investigations, United States Department of Agriculture. Received April, 1922.

"Samples of local varieties collected by the Sudan Department of Agriculture throughout Anglo-Egyptian Sudan in the region tributary to Khartum." (*Vinall.*)

55106. *Gassabi.*

55107. *Feterita.*

55108. *El Medeek el Abiad.*

55109. *Khamis Wad Gah.*

55110. *Asfar Homasi.*

55111. *Kaliko.*

55112. *Gusiri.*

55113. *Feterita.*

55114. *Hamisi.*

55115. *Abu Khammeir.*

55116. *Wad el Nebehi.*

55117. *Um Ghorirrat.*

55118. *Shallouft el Nega.*

55119. *Mogd Wad Fadl.*

55120. *Wad Abu Gutta.*

55121. *Baid el Wiz*

55122. *Ankolib Gassab.*

55123. *Hemaisc.*

55124. *Kalm Ahmer.*

55125. *Higiri.*

55106 to 55165—Continued.

55126. *Feterita.*
55127. *Abu Shanab.*
55128. *Banan Tokar.*
55129. *Wad Brageh.*
55130. *Mogd Abagro Abiad.*
55131. *Neili Neili.*
55132. *El Safra.*
55133. *Ahamar.*
55134. *Shikari.*
55135. *Kargi.*
55136. *Abgara.*
55137. *Kalam.*
55138. *Abu Homeer.*
55139. *No. 15.*
55140. *Ganie.*
55141. *El hacherag.*
55142. *Gussiri Tokar.*
55143. *Shamsham.*
55144. *Balyani.*
55145. *Beid el Tor.*
55146. *Mugood.*
55147. *Asfar.*
55148. *Wad Fahal.*
55149. *Wad bahana.*
55150. *Wad Akhar.*
55151. *Nugood.*
55152. *No. 40.*
55153. *No. 12.*
55154. *Hegeira.*
55155. *Abu Koliga.*
55156. *No. 8.*
55157. *Abu Tarakish.*
55158. *Moru.*
55159. *Naggad Abiad.*
55160. *Laben el Shah.*
55161. *Makway Abiad.*
55162. *Khass.*
55163. *Waga.*
55164. *Wad Bgota.*
55165. *Mogd Khamgan Asfer.*

55166 to 55211. Hibiscus spp. Malvaceæ. **Hibiscus.**

From Honolulu, Hawaii. Cuttings secured by Mrs. J. Rappe Myers, in Honolulu, and sent in by J. M. Westgate, agronomist in charge, Agricultural Experiment Station. Received March 27 and 30, 1922. Quoted notes by Mrs. Myers, unless otherwise stated.

The Chinese hibiscus is one of the most popular and useful decorative plants of tropical gardens and is cosmopolitan in its distribution. Probably in no other region, however, has so extensive a series of choice horticultural forms been brought together as in Hawaii. In most parts of the Tropics only two or three varieties are seen, usually the single scarlet and the double scarlet. In recent years some excellent sorts have been distributed by Florida nurserymen, yet it is felt that much more can and should be done to popularize the newer delicately colored varieties, and toward this end the following collection has been secured in Honolulu by Mrs. J. Rappe Myers. They should prove of real value in southern Florida and in Porto Rico, the Canal Zone, and the American Tropics generally.

"Most of these varieties are the productions of Gerrit P. Wilder."

55166 to 55192. "Collected March 11, 1922."

55166 to 55170. "Collected in Mrs. George Sherman's garden."

55166. Hibiscus syriacus L.

"(No. 1.) A lavender variety; originally from Japan."

55167. Hibiscus sp.

"(No. 2.) Single pink, shading white to the center."

55168. Hibiscus sp.

"(No. 3.) Single orange."

55169. Hibiscus sp.

"(No. 4.) Single, light pink."

55170. Hibiscus sp.

"(No. 5.) 'Laurita Sherman.'"

55166 to 55211—Continued.

55171. HIBISCUS sp.

"(No. 6.) A most beautiful, single, buff variety from Mrs. W. Woon's garden."

55172. HIBISCUS sp.

"(No. 7.) Fringed single red. From Haugh's garden."

55173. HIBISCUS sp.

"(No. 8.) A red-and-pink Fuchsia variety from Mrs. Rosa's garden."

55174. HIBISCUS sp.

"(No. 9.) Buff, single, with red center; from Helen Rosa's garden."

55175. HIBISCUS sp.

"(No. 10.) Single and double, light yellow; from Country Club grounds."

55176 to 55179. "From John Walker's garden."

55176. HIBISCUS sp.

"(No. 11.) Single, buff, light-red center."

55177. HIBISCUS sp.

"(No. 12.) 'Agnes Gault' variety."

55178. HIBISCUS sp.

"(No. 13.) Double yellow."

55179. HIBISCUS sp.

"(No. 14.) 'Mrs. Hassinger.'"

55180 to 55182. "From Mr. Anderson's garden."

55180. HIBISCUS sp.

"(No. 15.) Double red."

55181. HIBISCUS sp.

"(No. 16.) Bright red; double."

55182. HIBISCUS sp.

"(No. 17.) Largest, single white."

55183 to 55192. "From L. A. Thurston's garden."

55183. HIBISCUS sp.

"(No. 18.) Single, reddish mahogany banded in cream."

55184. HIBISCUS sp.

"(No. 19.) Single, rose pink; very fine."

55185. HIBISCUS sp.

"(No. 20.) Single, corn color, deep-red center."

55186. HIBISCUS sp.

"(No. 21.) Cerise pink, single."

55187. HIBISCUS sp.

"(No. 22.) Single, lavender buff."

55188. HIBISCUS sp.

"(No. 23.) Single, orange, crimson center."

55189. HIBISCUS sp.

"(No. 24.) Double. American Beauty shade."

55166 to 55211—Continued.

55190. HIBISCUS sp.

"(No. 25.) Single, flame red."

55191. HIBISCUS sp.

"(No. 26.) Single, orange pink."

55192. HIBISCUS sp.

"(No. 27.) Double, cerise."

55193 to 55211. "Collected March 14, 1922."

55193 to 55207. "From Gerrit P. Wilder's garden."

55193. HIBISCUS sp.

"(No. 28.) 'Nora Swanzy Sport,' unnamed, single, copper colored."

55194. HIBISCUS sp.

"(No. 29.) Single, yellow with red center; not named."

55195. HIBISCUS sp.

"(No. 30.) Double yellow. Very difficult to grow; no name."

55196. HIBISCUS sp.

"(No. 31.) 'Lita Wight' or 'Jamaica.' Single yellow."

55197. HIBISCUS sp.

"(No. 32.) 'Queen Kashumanu.' Single, salmon pink and orange."

55198. HIBISCUS sp.

"(No. 33.) 'Nora Swanzy.' Single, copper colored."

55199. HIBISCUS sp.

"(No. 34.) 'Auata Focke.' Single, lavender."

55200. HIBISCUS sp.

"(No. 35.) 'Lillian Nordica.' Single, pink with white center."

55201. HIBISCUS sp.

"(No. 36.) 'Lillian Wilder.' Single pink."

"Strong growth, erect, freely branching, light-gray bark, brownish twigs. Leaves ovate, serrate, slightly pubescent, shiny, dark green, 2 to 3¾ inches wide, 3½ to 5¼ inches long, petiole 2 inches. Flower 7 inches wide, delicate crimson pink with darker veins and crimson eye; column crimson, 3½ inches; peduncle 2¼ inches; bracts six to eight, slender, spreading, green. Sometimes self-seeds; crosses freely." (*E. V. Wilcox and V. S. Holt, Hawaii Agricultural Experiment Station, Bulletin No. 29, p. 38.*)

55202. HIBISCUS sp.

"(No. 37.) 'Helen Kimball.' Single."

55203. HIBISCUS sp.

"(No. 38.) 'Wilhelmina Tenny.' Single, orange yellow."

55204. HIBISCUS sp.

"(No. 39.) Hybrid; almost double."

55205. HIBISCUS sp.

"No. 40.) Hybrid; cross between white and pink."

55166 to 55211—Continued.

55206. HIBISCUS sp.

"(No. 41.) Yellow single."

55207. HIBISCUS sp.

"(No. 42.) Hybrid."

55208. HIBISCUS sp.

"(No. 43.) Single, light pink; from Punahou school grounds."

55209. HIBISCUS sp.

"(No. 44.) Single coral; from Punahou school grounds."

55210. HIBISCUS sp.

"(No. 45.) 'Eleanor Atherton.' Single, light pink; from F. C. Atherton's garden."

55211. HIBISCUS sp.

"(No. 46.) Double cerise from Frank Atherton's garden."

55212 to 55245.

From Gitschin, Bohemia, Czechoslovakia. Plants presented by Josef Mazanek. Received June 10, 1920. Numbered June, 1922.

These Czechoslovakian varieties of apples and pears are introduced for the use of specialists in this country.

55212 to 55232. MALUS SYLVESTRIS Mill. Malaceæ. (*Pyrus malus* L.) **Apple.**

55212. (No. 1.) *Ananasová reneta* (*Reinette Ananas*).

55213. (No. 2.) *Citronové zimni* (*Citron d'hiver*).

55214. (No. 3.) *Červené tvrdé* (*Cousinotte rouge d'hiver*).

55215. (No. 4.) *Holovouské malinové* (Raspberry apple from Holovous).

55216. (No. 5.) *Mazánkovo malinové* (Raspberry apple of Mr. Mazanek).

55217. (No. 6.) *Kminová reneta* (*Reinette du Canada*).

55218. (No. 7.) *Kožená reneta* (*Reinette grise française*).

55219. (No. 8.) *Limburské* (*La Limbourgeoise*).

55220. (No. 9.) *Mišenské* (*Edelborsdorfer*).

55221. (No. 10.) *Panenské* (*Rother Jungfern Apfel*).

55222. (No. 11.) *Parména zlatá* (*Reine de Reinettes*).

55223. (No. 12.) *Prince Albert* (*Lane's Prince Albert*).

55224. (No. 13.) *Reneta Pomfelic* (*Reinette de Pomphelia*).

55225. (No. 14.) *Řehtáč soudkovitý* (*Prinzenapfel, Pomme melon*).

55226. (No. 15.) *Štrymka* (*Gros-Bohn*).

55227. (No. 16.) *Šalove* (*Cardinal blanc flambaut*).

55228. (No. 17.) *Šampaňska reneta* (*Reinette blanche de Champagne*).

55229. (No. 18.) *Šmitbergrova reneta* (*Smitberger's Reinette*).

55230. (No. 19.) *Štětinské* (*Stetting Rouge*).

55231. (No. 20.) *Haglee Crab.*

55232. (No. 21.) *Holovouské malinové* (Raspberry apple from Holovous).

55212 to 55245—Continued.

55233 to 55245. PYRUS COMMUNIS L. Malaceæ. **Pear.**

55233. (No. 2.) *Amanlisova máslovka* (*Beurré d'Amnalis*).

55234. (No. 4.) *Avranska* (*Bonne Louise d'Avranches*).

55235. (No. 6.) *Ananswa česká* (Bohemian ananas pear).

55236. (No. 9.) *Dielova* (*Beurre Diel*).

55237. (No. 11.) *Kozačka Stutgartská* (*Rousselet de Stuttgart*).

55238. (No. 12.) *Křivice* (*Beurre Clairgeau*).

55239. (No. 13.) *Pastornice* (*Poire de Curé*).

55240. (No. 15.) *President Mas.*

55241. (No. 16.) *Pstružka* (*Forelle*).

55242. (No. 17.) *Solanka.*

55243. (No. 18.) *Wienská* (*Triomphe de Vienne*).

55244. (No. 19.) *Hardenpontova* (*Beurré Hardenpont*).

55245. (No. 20.) *Ratajská.*

55246 to 55252. MUSA PARADISIACA SAPIENTUM (L.) Kuntze. Musaceæ. **Banana.**

From Honolulu, Hawaii. Shoots presented by Willis T. Pope, horticulturist, Hawaii Agricultural Experiment Station. Received April 10, 1922.

55246. (No. 4490.) *Chamaluco.* The plant is from 10 to 15 feet in height with medium-sized leaves; when grown in fertile soil the bunches of fruit are rather large. There are two types—one with green and the other with gray fruits. The greater part of these fruits are eaten cooked at the time when other varieties are ripe. (Adapted from *Bulletin 25, Departamento de Agricultura y Trabajo, Porto Rico, p. 19.*)

For previous introduction, see S. P. I. No. 19303.

55247. "(No. 4489.) *Ice Cream.* This banana is said to have been introduced into the Hawaiian Islands from the Malay region of Asia. It was first grown at the Hawaii Station, Honolulu, in 1900, offshoots having been obtained from William Chamberlain, of Honolulu.

"Description of the plant: A 1-year old clump grown from a single offshoot usually consists of 8 or 10 plants, varying from a size suitable for transplanting up to full-grown plants maturing fruit. The average height of the full-grown plant is about 20 feet. Each mature plant usually has 10 or 12 light-green leaves at one time. The trunk is light green with parts of the outer leaf sheaths varying from light green to dark brown. The light brown often has a slight tinge of pink. The leaf blades are shiny light green above with a frosty lighter green below, due to a powdery bloom which does not rub off easily. The young leaves often have the under side of the midrib tinged with pink. Small offshoots have leaves with both margin and midrib of a delicate pink. The bases of the petioles of the larger leaves have abrasionlike marks of brown to dark brown such as are not uncommon on older plants of several other varieties.

"Fruit: The bunch of the *Ice Cream* variety is medium in size, varying in weight from 30 to 60 pounds. In color it is strikingly different from most other yellow bananas. It has a whitish or bluish green color before maturity, which is due to the powdery bloom covering the entire fruit. This powdery bloom remains quite evident after the yellowing and full ripening of the fruit. The bananas usually ripen irregularly on the bunch. After ripening, the bananas very soon

55246 to 55252—Continued.

become soft and have a tendency to fall from the bunch. The hands of bananas are usually seven or eight in number and average about 14 bananas to the hand. Each fruit is from 5 to 7 inches in length and from 2 to 2½ inches in diameter, with a weight of 7 or 8 ounces. The skin of the ripe fruit is of medium thickness, and tender, and separates, leaving a portion of its inner lining on the pulp of the fruit when peeled. The pulp is rather spongy and white or creamy white in color, suggestive of ice cream, hence its name. The flavor is slightly tart and applelike." (*Pope.*)

55248. "(No. 4499.) *Iholena.* The plant is of low growth and grows about 9 feet to the top of the leaves as an average. The petioles are rather stout, light green with pink on the edges; leaves slightly bronze colored on the under surface when young. The bunch is rather small. The fruits are arranged loosely and stand out almost at right angles from the axis of the bunch. The skin of immature fruits is light green, turning to yellow before ripening. The form of the fruit is angular; when thoroughly ripe, beginning to turn black. It is regarded as one of the best of the native bananas for eating raw. It is also good for cooking. The flesh is pink." (*J. E. Higgins, Bulletin 7, Hawaii Agricultural Experiment Station.*)

For previous introduction, see S. P. I. No. 22064.

55249. "(No. 4731.) *Kona Maiamaole* or *Maiamaoli*, as it is sometimes called, is, I believe, the best cooking banana in these islands, and I believe it has commercial possibilities in a locality like Kona, where much good land may be had with sufficient rainfall, little wind, and rich soil overlying a most favorable underdrainage." (*Pope.*)

55250. "(No. 4497.) *Largo.* Introduced into Hawaii from Mexico. The plant is of medium height, and the fruits, borne in long-stemmed bunches, have buttery pinkish flesh of fair flavor." (*J. E. Higgins, Bulletin 7, Hawaii Agricultural Experiment Station.*)

55251. "(No. 4495.) *Porto Rico.* This variety was introduced from Porto Rico by the Hawaii station in 1904.

"Description of the plant: Average height about 25 feet. Mature trunks become about 10 or 12 inches in diameter at the base. Each trunk supports 10 or 12 green leaves about 12 feet long. The color of the trunk sheaths varies from a shade of pink to dark brown. The color of the leaves is dull green above and light green below, with abrasionlike markings at the base of the petioles where they begin to extend from the sheath.

"Description of the fruit: The bunch is small to medium in size, weighing 25 to 40 pounds, and usually consists of five or six hands. The banana is smooth with angle ridges not prominent, apex or blossom end somewhat beaked, and not well filled, even on bunches which show plump fruit from good culture. The skin is bright yellow and peels well when fruit is ripe. The flesh is light yellow and rather juicy, sweet, with a pleasant flavor somewhat like that of the apple. The fruit ripens uniformly and holds well on the bunch.

"The *Porto Rico* is a very desirable banana for growing in the home garden, as most of its qualities are such as are desired in a fresh fruit for home use." (*Pope.*)

55252. "(No. 4492.) *Red Cuban.* This is the proper name of the largest sized variety of the various red bananas; large both as to plant and fruit. A well-grown bunch has 8 to 10 hands and individual fingers of from 2 to 2½ inches in diameter. This is the red banana of commerce." (*Goldsmith H. Williams, Crescent City, Fla.*)

55253 to 55366.

From Neston, Cheshire, England. Seeds presented by A. K. Bulley. Received April 20, 1922. Quoted notes by Mr. Bulley, unless otherwise stated.

"Collected by Dr. F. Kingdon Ward in Szechwan, China."

55253. ANDROSACE SPINULIFERA (Franch.) Kunth. Primulaceæ.

"(No. 4042.) An erect plant with rose-pink flowers."

A hairy alpine plant with narrowly oval leaves and a scape up to 8 inches high bearing heads of purplish flowers. It is native to the mountains of central China. (Adapted from *Engler, Das Pflanzenreich, vol. 22, p. 184.*)

55254. ANDROSACE sp. Primulaceæ.

"(No. 4388.) Rose pink, darker eye."

55255. ANEMONE RUPICOLA Cambess. Ranunculaceæ.

"(No. 4276.)"

A robust Chinese anemone about a foot in height which produces an abundance of showy flowers that are pure white with the outer sepals rosy lilac. (Adapted from *The Garden, vol. 79, p. 272.*)

For previous introduction, see S. P. I. No. 38999.

55256. CAMPANULA sp. Campanulaceæ.

"(No. 4605.) A dwarf plant with violet flowers."

55257. CAMPANULA sp. Campanulaceæ.

"(No. 4805.) A plant with pale-blue flowers."

55258. CARAGANA sp. Fabaceæ.

"(No. 4147.) Flowers sulphur yellow."

55259. CARDAMINE sp. Brassicaceæ.

"(No. 4483.) Collected at 13,000 to 14,000 feet altitude. A plant growing a foot high with fragrant purple flowers."

55260. CLEMATIS sp. Ranunculaceæ.

"(No. 4585.) Purple flowers with silver stamens."

55261. CLEMATIS sp. Ranunculaceæ.

"(No. 4877.) Clusters of straw-yellow flowers."

55262. CODONOPSIS sp. Campanulaceæ.

"(No. 4446.) A plant 15 inches in height with purple flowers."

55263. CODONOPSIS sp. Campanulaceæ.

"(No. 4618.) Collected at 13,000 to 14,000 feet elevation. A plant 8 to 12 inches high with pale lavender-blue flowers."

55264. CREMANTHODIUM sp. Asteraceæ.

"(No. 4210.) A plant with nodding purple flowers."

55265. CREMANTHODIUM sp. Asteraceæ.

"(No. 4619.) Sulphur-colored flowers."

55266. CREMANTHODIUM sp. Asteraceæ.

"Nodding yellow flowers."

55267. CREPIS sp. Cichoriaceæ.

"Collected at 13,000 feet elevation."

55268. CYNOGLOSSUM sp. Boraginaceæ.

"(No. 4093.) A plant with deep-blue flowers."

55253 to 55366—Continued.

55269. DELPHINIUM sp. Ranunculaceæ. **Larkspur.**

"(No. 4570.)"

55270. DEUTZIA sp. Hydrangeaceæ.

"(No. 4537.) A plant with white flowers."

55271. DRABA sp. Brassicaceæ.

"(No. 4150.) Tufted golden yellow flowers."

55272. EUONYMUS sp. Celastraceæ.

"(No. 4526.) A plant growing from 10 to 15 feet in height."

55273. FRITILLARIA sp. Liliaceæ.

"(No. 4030.) Flowers dull yellowish green, spotted and speckled with chocolate."

55274 to 55279. GENTIANA spp. Gentianaceæ.

55274. GENTIANA DETONSA Rottb.

"(No. 4757.)"

A gentian native to the cold regions of northeastern Asia, with a very short stem and oblong leaves arranged more or less in a basal rosette. The flowers, borne singly, are deep blue with the corolla lobes wavy at the tips. (Adapted from *Turczaninow, Flora Baicalensi-Dahurica, No. 13, p. 322.*)

55275. GENTIANA sp.

"(No. 4637.) Deep-blue flowers."

55276. GENTIANA sp.

"(No. 4859.) Bright-blue flowers; plant more or less prostrate."

55277. GENTIANA sp.

"(No. 4941.) Steel-blue flowers."

55278. GENTIANA sp.

"(No. 4968.) Bright-violet flowers."

55279. GENTIANA sp.

"(No. 4992.) Violet flowers."

55280. HEDYCHIUM sp. Zinziberaceæ.

"(No. 3792.) A plant growing 6,000 to 7,000 feet above A-lu-shih."

55281. HEMEROCALLIS sp. Liliaceæ.

"(No. 4776.) A plant 8 to 12 inches in height with fawn-orange flowers."

55282. INCARVILLEA sp. Bignoniaceæ.

"(No. 4197.) A tall plant with sulphur-yellow flowers."

55283 to 55292. IRIS spp. Iridaceæ. **Iris.**

55283. IRIS sp.

55284. IRIS sp.

"(No. 3791.)"

55285. IRIS sp.

"(No. 4025.) Deep-violet, almost black, flowers."

55286. IRIS sp.

"(No. 4073.) A dwarf plant with violet flowers; collected at 13,000 to 14,000 feet elevation."

55253 to 55366—Continued.

55287. IRIS sp.

"(No. 4101.) Lemon and black crests."

55288. IRIS sp.

"(No. 4193.) Collected at 13,000 feet elevation."

55289. IRIS sp.

"(No. 4243.) Violet fold markings on falls."

55290. IRIS sp.

"(No. 4433.) Slate-blue flowers."

55291. IRIS sp.

"(No. 4434.) Violet fold markings."

55292. IRIS sp.

"(No. 5000a.) Collected at 9,000 to 10,000 feet elevation."

55293 to 55295. LILIUM spp. Liliaceæ. **Lily.**

55293. LILIUM sp.

"(No. 4074.) Solitary nodding canary-colored flowers."

55294. LILIUM sp.

"(No. 4242.) Plant 3 to 4 feet high with pale-purple flowers."

55295. LILIUM sp.

"(No. 4245.) Flowers brownish yellow with trumpets finely spotted over a white ground."

55296. LONICERA sp. Caprifoliaceæ. **Honeysuckle.**

"(No. 4134.) Large, scarlet, translucent fruits."

55297. LONICERA sp. Caprifoliaceæ. **Honeysuckle.**

"(No. 4192.) A plant 6 to 10 inches high with pale-purple flowers."

55298. LYCHNIS sp. Silenaceæ.

"(No. 4236.) Very small white or pinkish flowers; calyx bladdery, pale green striped with chocolate."

55299. LYCHNIS sp. Silenaceæ.

"(No. 4964.) A dwarf plant with pale purplish pink flowers."

55300 to 55304. MECONOPSIS spp. Papaveraceæ.

55300. MECONOPSIS ACULEATA Royle.

"(No. 4171.)" A biennial Himalayan plant with hairy stems and rosettes of blunt-pointed leaves. The flowers, bright blue with golden yellow throats, are borne in spikelike racemes, the flowers opening from the top of the raceme downward. (Adapted from *The Garden, vol. 75, p. 226.*)

55301. MECONOPSIS PRIMULINA Prain.

"(No. 4008.)"

A plant found in stony places in the eastern Himalayas, at 12,000 to 14,000 feet altitude. The leaves are narrow and the flowers bright blue. (Adapted from *Annals of Botany, vol. 20, p. 350.*)

55302. MECONOPSIS PSEUDOINTEGRIFOLIA Prain.

"(No. 4169.)" A stemless hairy plant from southwest Tibet, China, with narrow leaves and 1-flowered scapes; the flowers are bright yellow and up to 3 inches in diameter. (Adapted from *Annals of Botany, vol. 20, p. 353.*)

For previous introduction, see S. P. I. No. 51750.

55253 to 55366—Continued.

55303. MECONOPSIS sp.

"(No. 4164.) A plant growing a foot high with sky-blue flowers."

55304. MECONOPSIS sp.

"(No. 4640.) Violet flowers."

55305. OREOCHARIS sp. Gesneriaceæ.

"(No. 3995.) Yellow drooping flowers."

55306. PHLOMIS sp. Menthaceæ.

"(No. 4644.) Pale-pink flowers."

55307. PICEA sp. Pinaceæ. **Spruce.**

"(No. 3954.) A graceful tree 50 feet in height, growing at 9,000 to 11,000 feet altitude."

55308 to 55351. PRIMULA spp. Primulaceæ. **Primrose.**

55308. PRIMULA BELLA Franch.

"(No. 4082.) Violet or purple flowers."

In damp, sandy, mountain pasture land on the Mekong-Salwin D'vide, western Yunnan, China, this attractive primrose was originally collected. It is little more than 2 inches in height, but bears beautiful pale-rose or deep bluish rose flowers with greenish white eyes, fairly fragrant. (Adapted from *Notes from the Royal Botanic Garden, Edinburgh, vol. 4, p. 225.*)

For previous introduction, see S. P. I. 48353.

55309. PRIMULA BLATTARIFORMIS Franch.

"(No. 4520.)"

A primrose from limestone regions in Yunnan, China; in general appearance it resembles the smooth mullein, *Verbascum blattaria*, hence its name. The leaves form a close rosette, and the lilac flowers are borne in spikelike racemes. (Adapted from *Journal of the Royal Horticultural Society, vol. 39, p. 145.*)

55310. PRIMULA BREVIFOLIA Forrest.

"(No. 4173.)"

From a rosette of bright-green, oblong leaves rises a purplish scape which ends in a cluster of a half dozen or more drooping flowers; each has a dark-purple calyx and a fringed, blue-purple corolla. The plant is native to Yunnan, China. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 57, p. 207.*)

55311 and 55312. PRIMULA DRYADIFOLIA Franch.

A somewhat shrubby Chinese primrose with small leaves and large, drooping, rose-colored flowers with dark-purple bracts. (Adapted from *Journal of the Royal Horticultural Society, vol. 39, p. 165.*)

For previous introduction, see S. P. I. No. 48359.

55311. "(No. 4100.)" **55312.** "(No. 4109.)"

55313 and 55314. PRIMULA MALVACEA Franch.

A primrose from the mountains of Yunnan, China, densely covered with short hairs, with bright-green leaves about 3 inches in length and thick scapes which bear two or three umbels of reddish flowers. (Adapted from *Engler, Das Pflanzenreich, vol. 22, p. 26.*)

55313. "(No. 4351.)" **55314.** "(No. 4181.)"

55253 to 55366—Continued.

55315 to 55319. PRIMULA MUSCARIOIDES Hemsl.

A primrose with rather fleshy light-green leaves 4 or 5 inches in length. The scapes, twice as long as the leaves, bear the heads of deep purple-blue or almost violet flowers. The plant inhabits moist open places on the edges of forests in Yunnan, China. (Adapted from *Curtis's Botanical Magazine, pl. 8168.*)

55315. "(No. 4436.)"

55316. "(No. 4180.)"

55317. "(No. 4077.)"

55318. "(No. 4225.)"

55319. "(No. 4748.)"

55320 to 55332. PRIMULA NIVALIS Pall.

This species is found in every part of the world where primroses grow excepting South America: it varies considerably according to its geographic location. The rather thick, ribbon-shaped leaves are often coated with silver or golden meal, and the flowers, usually blue or purple but sometimes white, are borne in large clusters. (Adapted from the *Journal of the Royal Horticultural Society, vol. 39, p. 160.*)

For previous introduction, see S. P. I. No. 48369.

55320. "Deep Tyrian purple with an eye almost black."

55321 and 55322. "(No. 4055.)"

55323 and 55324. "(No. 4080.)"

55325. "(No. 4141.)"

55326 and 55327. "(No. 4176.)"

55328 to 55330. "(No. 4385.)"

55331. "(No. 4911.)"

55332. "(No. 5000 K.)"

55333 and 55334. PRIMULA POISSONI Franch.

"(No. 4024.)"

A stout, smooth Chinese primrose with rigid, leathery, oblong, pale-green leaves 2 or 3 inches long and a solitary flower stalk which bears one or more whorls of pink flowers. (Adapted from *Curtis's Botanical Magazine, pl. 7216.*)

55335 and 55336. PRIMULA SECUNDIFLORA Franch.

"(No. 4175.)"

This is one of the finest Chinese primroses; it is a native of the Likiang Mountains in northwestern Yunnan, China, where it ascends almost to snow level, 15,000 feet above the sea. On the lower plateaus, at 11,500 feet altitude, this plant forms dense colonies with scapes up to 14 inches in height. The fragrant flowers are a beautiful shade of deep crimson, faintly tinged with purple, and droop gracefully from the scapes. The calyxes are ruddy purple, marked with white lines along the margins. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 51, p. 281.*)

For previous introduction, see S. P. I. No. 48375.

55337 and 55338. PRIMULA SIKKIMENSIS Hook.

A robust primrose from rather wet situations in the Himalayas at altitudes of 12,000 to 17,000 feet. It sends up strong flower stems a foot or two in height, which bear numerous bell-shaped pale-yellow fragrant flowers. This species is hardy in England. (Adapted from *Robinson, English Flower Garden, p. 739.*)

For previous introduction, see S. P. I. No. 48378.

55337. "(No. 4930.)"

55338. "(No. 4179.)"

55253 to 55366—Continued.

55339. PRIMULA SINOPURPUREA Balf. f.

"(No. 4181.)"

This is one of the most striking primroses of the *nivalis* group. It is native to Yunnan, China, and is a stout herbaceous plant usually about 4 inches high. The narrow leaves are thinly papery, with yellow mealy lower surfaces, and the stout scapes bear deep-violet flowers. (Adapted from *Curtis's Botanical Magazine, pl. 8777.*)

For previous introduction, see S. P. I. No. 48379.

55340. PRIMULA VINCIFLORA Franch.

"(No. 4172.)"

A rather tall Chinese primrose, sometimes over a foot in height, with beautiful flowers of a deep indigo-purple shade; the calyx tube is yellowish at the base. In its native home it grows in masses of 20 to 30 plants in one clump. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 46, p. 344.*)

For previous introduction, see S. P. I. No. 48381.

55341. PRIMULA sp.

"(No. 3920.) Flowers pinkish crimson with a yellow eye."

55342. PRIMULA sp.

"(No. 3951.) Orange-colored flowers."

55343 and 55344. PRIMULA sp.

"(No. 5000 J.) A plant growing at 8,000 feet altitude, with purplish crimson flowers."

55345. PRIMULA sp.

"(No. 4445.)"

55346. PRIMULA sp.

"(No. 4225.)"

55347. PRIMULA sp.

"(No. 4275.)"

55348. PRIMULA sp.

"(No. 4181.)"

55349. PRIMULA sp.

"(No. 4174.)"

55350. PRIMULA sp.

"(No. 4081.)"

55351. PRIMULA sp.

"A plant 8 to 10 inches high, growing at 9,000 to 10,000 feet altitude."

55352. PYROLA sp. Pyrolaceæ.

"(No. 4262.) Cream-colored flowers."

55353. RHEUM sp. Polygonaceæ.

"(No. 3794.)"

55354 to 55359. RHODODENDRON spp. Ericaceæ.

55354. RHODODENDRON sp.

55355. RHODODENDRON sp.

"(No. 4160.) A snowy white, dwarf alpine plant."

55356. RHODODENDRON sp.

"(No. 4170.) Bell-shaped, lemon flowers."

55357. RHODODENDRON sp.

"(No. 4177.) A plant 6 to 8 feet in height; flowers pink with dark spots."

55253 to 55366—Continued.

55358. RHODODENDRON sp.

"(No. 4456.) A bush 2 to 3 feet in height."

55359. RHODODENDRON sp.

"(No. 4486.) A plant 5 feet in height."

55360 to 55364. SAXIFRAGA spp. Saxifragaceæ.

55360. SAXIFRAGA sp.

"A yellow variety found in woods."

55361. SAXIFRAGA sp.

55362. SAXIFRAGA sp.

"(No. 4628.) Orange-colored flowers; plant 6 to 9 inches in height."

55363. SAXIFRAGA sp.

"(No. 4654.) Flowers yellow."

55364. SAXIFRAGA sp.

"(No. 4905.) A plant 6 to 9 inches in height with chocolate-colored flowers."

55365. SWERTIA sp. Gentianaceæ.

"(No. 4977.) A plant 2 to 4 inches high."

55366. VERATRUM sp. Melanthiaceæ.

"(No. 4832.) An erect plant 12 to 15 inches in height with violet flowers."

55367. CUCURBITA PEPO L. Cucurbitaceæ. **Squash.**

From Paris, France. Seeds presented by Vilmorin-Andrieux & Co. Received May 8, 1922.

The "Naples squash" has trailing stems, usually about 10 feet long, and dull-green leaves with grayish white veins and spots. The cylindrical fruit is up to 2 feet in length, with smooth dark-green skin which becomes yellow when the fruit is ripe. The orange-colored flesh is abundant and sweet. This variety is very productive, and the fruit is of excellent quality, keeps well, but ripens rather late. (Adapted from *Robinson, The Vegetable Garden, p. 326.*)

55368. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Lodi, Italy. Seeds purchased from Consorzio Agrario Cooperativo Lodigiano, through William H. Stevenson, International Agricultural Institute, Rome, Italy. Received May 8, 1922.

Introduced for cultural experiments and comparison with American-grown varieties.

55369. CROTALARIA JUNCEA L. Fabaceæ. **Sunn hemp.**

From Honolulu, Hawaii. Seeds presented by J. M. Westgate, agronomist in charge, Agricultural Experiment Station. Received May 9, 1922.

Introduced for testing as a green manure, for which purpose it is used in India. It is, however, also used in that country as a fiber plant and as a catch crop.

For previous introduction, see S. P. I. No. 43502.

55370 and 55371. Rubus spp. Rosaceæ.

From Sitka, Alaska. Plants and roots presented by C. C. Georgeson, agronomist in charge, Agricultural Experiment Station. Received May 17, 1922.

Introduced for cultural and breeding experiments.

55370. Rubus chamaemorus L. **Cloudberry.**

The cloudberry is of circumpolar distribution, and the edible yellowish fruits are much prized by natives of the Arctic regions. The plant is creeping in habit and is frequently found in peat bogs.

For previous introduction, see S. P. I. No. 24379.

55371. Rubus spectabilis Pursh. **Salmon berry.**

The salmon berry is a native of northwestern North America from California to Alaska; it is a vigorous plant with canes 5 to 15 feet in length and large, conical, salmon-colored fruits.

For previous introduction, see S. P. I. No. 23452.

55372. Lapageria rosea Ruiz and Pav. Liliaceæ. Copihue.

From Angol, Chile. Seeds purchased from F. L. Crouse, Instituto Agricola Bunster, Angol. Received May 19, 1922.

"*Copihue.* This, the national flower of Chile, has been occasionally grown in northern greenhouses, where it creates a genuine sensation when in bloom. It is a climbing plant of slow growth, with slender, wiry stems and bright-crimson tubular flowers about 3 inches in length. In southern Chile huge bunches of these blossoms are brought to the railway stations and sold to passing travelers. The plant requires an acid soil." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 54621.

55373 and 55374. Juglans spp. Juglandaceæ. Walnut.

From Buenos Aires, Argentina. Nuts presented by D. S. Bullock, agricultural commissioner, Bureau of Markets and Crop Estimates. Received May 13, 1922. Quoted notes by Mr. Bullock.

55373. Juglans sp.

"From the eastern foothills of the Andes at Limoncito, Rio Blanco, or Iruya, Province of Salta. Collected in August, 1921, by A. G. Maddren."

55374. Juglans sp.

"From the Sierra de Lumbrera, a well-watered small mountain range just east of the Andes, in the Department of Metan, Province of Salta. The 'Nogal' trees grow along the small creeks at an altitude of 3,000 to 4,000 feet. Collected by D. S. Birkett."

55375 to 55398.

From Copenhagen, Denmark. Presented by Government Seed Control. Received May 11, 1922. Quoted notes by Dr. A. S. Hitchcock, of the United States Department of Agriculture.

The Danish Government, in cooperation with the seed growers of Denmark, is conducting extensive tests of commercial crops of value for cultivation there. These seeds are selections of some of their more promising varieties.

55375. Alopecurus pratensis L. Poaceæ. **Meadow foxtail.**

(No. 40.) "Meadow foxtail is sometimes used as a meadow grass in the eastern United States. It is recommended for mixtures on moist soil, being nutritious and producing early forage. It is an erect grass 2 to 3 feet tall."

55375 to 55398—Continued.

55376. ANTHYLLIS VULNERARIA L. Fabaceæ. **Kidney vetch.**

(No. 32.) A perennial herb found throughout Europe, northern Africa, and Asia, which is grown for sheep fodder and is particularly recommended for lime soils. In Norway it is native as far north as 70°. (Adapted from *Von Mueller, Select Extra-Tropical Plants, p. 48.*)

55377. ARRHENATHERUM ELATIUS (L.) Mert. and Koch. Poaceæ. (*A. avenaceum* Beauv.)

(No. 37.) "This is occasionally cultivated in humid regions in the United States as a meadow grass; it is a fairly satisfactory forage grass."

55378. AVENA SATIVA L. Poaceæ. **Oats.**

(No. 49.)

55379 and 55380. BETA VULGARIS L. Chenopodiaceæ. **Beet.**

55379. (No. 44.) 55380. (No. 45.) Sugar beet.

55381. BRASSICA NAPUS L. Brassicaceæ. **Rape.**

(No. 47.)

55382. DACTYLIS GLOMERATA L. Poaceæ. **Orchard grass.**

(No. 36.) "A well-known meadow and pasture grass, cultivated in the humid regions of the United States."

55383. DAUCUS CAROTA L. Apiaceæ. **Carrot.**

(No. 46.)

55384. FESTUCA DURIUSCULA L. Poaceæ. **Hard fescue.**

(No. 39.) "This grass, rare in America, is used in mixtures for lawns, especially for sterile or stony soil."

55385. FESTUCA ELATIOR L. Poaceæ. **Meadow fescue.**

(No. 38.) "Meadow fescue is cultivated for hay and pasture in humid regions of the United States."

55386. HORDEUM DISTICHON PALMELLA Harlan. Poaceæ. **Barley.**

(No. 50.)

55387. LOLIUM MULTIFLORUM Lam. Poaceæ. **Italian rye-grass.**

(No. 35.)

55388. LOTUS CORNICULATUS L. Fabaceæ.

(No. 31.) An excellent fodder, and considered a valuable element in meadows and pastures in Australia and Tasmania, where it is native. (Adapted from *Maiden, Useful Native Plants of Australia, p. 134.*)

For previous introduction, see S. P. I. No. 48634.

55389. MEDICAGO LUPULINA L. Fabaceæ. **Black medic.**

(No. 30.)

55390. MEDICAGO SATIVA L. Fabaceæ. **Alfalfa.**

(No. 29.)

55391. NOTHOLCUS LANATUS (L.) Nash. Poaceæ. **Velvet grass.** (*Holcus lanatus* L.)

(No. 43.) "Velvet grass has value as a meadow grass on moist sandy or sterile soil where other grasses will not thrive. It is an erect grass 2 to 3 feet tall."

55392. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

(No. 33.)

55393. POA PRATENSIS L. Poaceæ. **Kentucky bluegrass.**

(No. 42.)

55375 to 55398—Continued.

55394. POA TRIVIALIS L. Poaceæ. Rough-stalked meadow grass.

(No. 41.) A grass with stems decumbent at the base. Not only the stems but also the leaves and sheaths are very rough. The panicle is 2 to 5 inches long.

55395. SECALE CEREALE L. Poaceæ. Rye.

(No. 48.)

55396. TRIFOLIUM HYBRIDUM L. Fabaceæ. Alsike clover.

(No. 28.)

55397. TRIFOLIUM PRATENSE L. Fabaceæ. Red clover.

(No. 26.)

55398. TRIFOLIUM REPENS L. Fabaceæ. White clover.

(No. 27.)

55399 to 55404. CUCUMIS MELO L. Cucurbitaceæ. Muskmelon.

From Lucknow, United Provinces, India. Seeds presented by F. H. Johnson, superintendent, Government Horticultural Gardens. Received May 9, 1922.

Seeds of six distinct varieties of Kharbusa (melons).

55399. *Chitta.* **55400.** *Khurra.*

55401 and 55402. *Safada.* This is perhaps the finest of Indian melons and is grown in sandy loam along river banks. It is the size of a very large orange, flattened at both ends, and white inside and out. (Adapted from *Watt, Commercial Products of India, p. 438.*)

55401. *Safada* (big). **55402.** *Safada* (Mandyaon).

55403. *Sarda.* A fine variety cultivated in India, originally introduced from Kabul, Afghanistan, for the wealthy natives of the Punjab. The seeds of this melon are distinguished by their very large size. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting, p. 156.*)

55404. Mixed.

55405. AMARANTHUS VIRIDIS L. Amaranthaceæ.

From Antigua, Leeward Islands. Seeds presented by Edwin A. Thompson, junior assistant, Imperial Department of Agriculture. Received May 16, 1922.

"I obtained this variety recently in Montserrat; the seeds were from locally grown plants of a special type of West Indian spinach, which is an undoubted acquisition. The plant becomes about 5 feet in height, and during its early growth the leaves are large, about the size of a dessert plate. During the recent extreme drought in Antigua I have been able to have a side dish of this vegetable at least twice a week." (*Thompson.*)

55406 and 55407. SOLANUM TUBEROSUM L. Solanaceæ. Potato.

From Galicia, Austria. Tubers purchased from Heinrich Dotkowski & Son. Received May 18, 1922.

55406. "*Petronius.* This variety is fairly vigorous in growth and the plants are large, compact, and healthy with strong erect medium green stems. The leaves are medium to large and rather dark green; the flowers are white, and pollen is produced rather freely. The tubers are light skinned, the eyes medium in number and depth. It is not a very productive variety, being chiefly valuable for breeding purposes." (*William Stuart.*)

For previous introduction, see S. P. I. No. 33487.

55407. *Rubin.*

55408 and 55409. RUBUS MACROCARPUS Benth. Rosaceæ. **Colombian berry.**

From Bogota, Colombia. Presented by W. O. Wolcott. Received May 10, 1922.

"Seeds of very large wild blackberries." (*Wolcott.*)

55410. GOSSYPIUM ANOMALUM Wawra. Malvaceæ. **Cotton.**

From Asmara, Eritrea, Africa. Seeds presented by the director, Eritrea Colonization Service. Received April 19, 1922.

"This cotton has a very short staple, but it is soft and shining like silk. It is used by native textile workers." (*A. M. Tancredi, Notizie e Studi sulla Colonia Eritrea, p. 110.*)

According to one authority this is the only truly wild cotton in Africa; it has been found in Angola and also in the Anglo-Egyptian Sudan. It forms a shrub 5 to 10 feet in height, with rough branches, reddish flowers, and oval capsules about an inch in length, much smaller than cultivated cotton. (Adapted from *Oliver, Flora of Tropical Africa, vol. 1, p. 211.*)

55411. AMERIMNON SISSOO (Roxb.) Kuntze. Fabaceæ. **Sissu.**
(*Dalbergia sissoo* Roxb.)

From Dehra Dun, United Provinces, India. Seeds presented by R. S. Hole, forest botanist. Received May 16, 1922.

A large deciduous tree native to tropical and subtropical regions of the lower Himalayas. It is highly esteemed for its very durable wood, which seasons well, does not warp or split, and is strong and elastic. The thin layer of sapwood is white, while the heartwood is brown, with darker longitudinal veins, and is very hard. (Adapted from *Gamble, Manual of Indian Timbers, p. 124.*)

55412. DIOSCOREA ALATA L. Dioscoreaceæ. **Greater yam.**

From India. Tuber presented by E. R. Sasscer, Federal Horticultural Board, United States Department of Agriculture. Obtained by L. M. Scott, inspector, Boston, Mass., from baggage on the steamship *City of Valencia.* Received April 19, 1922.

"*Purple Ceylon.* In India this yam is said to be called 'King of Yams.' The specimen received weighs about 13 ounces, is roughly spherical, and has deep-purple flesh, being similar in these respects to the *Purple Ceylon* previously received from Porto Rico (S. P. I. No. 54900). The flesh retains its color when cooked, is smooth in texture, and of very good flavor." (*R. A. Young.*)

55413. COIX LACRYMA-JOBI L. Poaceæ. **Job's-tears.**

From Muang Hai, southern Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received May 9, 1922.

"(No. 2485. February 17, 1922.) Collected along brooks near Muang Hai, southern Yunnan, at an altitude of 4,000 feet; may be of interest to cereal specialists." (*Rock.*)

For previous introduction, see S. P. I. No. 49516.

55414 to 55416. CITRUS spp. Rutaceæ.

From Shaowu, Fukien, China, Presented by Rev. J. E. Walker, Shaowu Mission of the American Board. Received May 16, 1922.

"Seeds from varieties equal to the best in Amoy, Fukien." (*Walker.*)

55414. CITRUS sp.

55415. CITRUS sp.

55416. CITRUS sp.

55417. PRUNUS MAJESTICA Kochne. Amygdalaceæ. **Cherry.**

From Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received May 16, 1922.

"(No. 2884. Between Puerhfu and Mohei, Yunnan. March 18, 1922.) A tree 25 to 30 feet in height with ascending branches, growing on exposed dry ridges 6,000 feet or more in altitude. The cherries, which are borne in March, are oblong to ovoid, bright red, with scanty but juicy bitter flesh. The tree grows in company with *Pyrus yunnanensis*, *P. pashia*, *Larix* sp., and several other species of Prunus and Malus which are now in flower." (*Rock.*)

55418. PHASEOLUS SEMIERECTUS L. Fabaceæ.

From Gatun, Canal Zone. Seeds presented by J. A. Close. Received May 18, 1922.

"The long narrow pods are of a leguminous plant which I am trying out as a cover crop. I first noticed the dark-purple flowers, about the size and shape of sweet peas, along the railroad track at Gatun, but the plant did not grow well in the gravel. When planted in heavy clay mixed with charcoal, however, it developed wonderfully, and the vines formed a dense mat which allowed no other vegetation to grow under or through it. The plants grew about 3 feet high, and in the last month of the dry season the ground was covered with the decaying leaves. New plants have appeared a hundred feet from the old planting." (*Close.*)

55419 to 55423. ACACIA spp. Mimosaceæ.

From Khartum, Anglo-Egyptian Sudan. Seeds presented by E. E. Massey, Government botanist, Sudan Government Department of Agriculture, through Maj. R. G. Archibald, Wellcome Tropical Research Laboratories. Received May 15, 1922.

Introduced for experimental planting in the southwestern United States in connection with gum-arabic production.

55419. ACACIA ALBIDA Delile.

A low, much-branched tree with whitish bark, axillary spikes of white flowers, and flat, oblong pods. It is a native of tropical Africa and yields a gum similar to gum arabic. The leaves are eaten by goats, and the bark is used in curing leather. (Adapted from *Oliver, Flora of Tropical Africa, vol. 2, p. 339, 1871*, and *Kew Bulletin of Miscellaneous Information, Additional Series IX, pt. 2, p. 288.*)

For previous introduction, see S. P. I. No. 44922.

55420. ACACIA CATECHU (L. f.) Willd.

A moderate-sized tree with dark-brown, much-cracked bark, very finely pinnate leaves, spikes of white or pale-yellow flowers, and narrow dark-brown pods. It is found in most parts of India and Burma, sometimes becoming over 70 feet tall with a circumference of 8 or 9 feet. It yields a pale-yellow gum, with tears often an inch in diameter, which is a strong mucilage and a better substitute for gum arabic than the gum of *Acacia arabica*. This species is also the source of cutch, the resinous extract obtained by boiling down a decoction obtained from chips of the heartwood; from this extract a dull-red dye may be obtained.

The sapwood is yellowish white, and the heartwood, which is extremely hard, is either light or dark red. The wood is very durable, takes a fine polish, and is not attacked by white ants or shipworms. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 27.*)

For previous introduction, see S. P. I. No. 50711.

55421. ACACIA NUBICA Benth.

An umbrella-shaped shrub 4 to 5 feet high, with dark greenish bark, small leaflets, and rather large heads of fragrant yellowish flowers. It is native to Abyssinia and the western coast of Arabia. (Adapted from *Linnaea, vol. 35, p. 337.*)

55419 to 55423—Continued.

55422. ACACIA SPIROCARPA Hochst.

An umbrellalike tree 20 to 40 feet in height with snow-white heads of fragrant flowers and narrow, spirally twisted pods. It is quite common in dry, open, rocky places in Abyssinia at an altitude of about 4,500 feet. (Adapted from *Chiovenda, Osservazioni Botaniche nell'Abissinia, p. 101.*)

55423. ACACIA VERUGERA Schweinf.

This Abyssinian acacia forms a handsome tree 60 feet in height, with very long spines, light-green feathery foliage, and round heads of pale-yellow flowers. (Adapted from *Linnaea, vol. 35, p. 340.*)

For previous introduction, see S. P. I. No. 44924.

55424 to 55441.

From Harbin, northern Manchuria. Presented by B. W. Skvortzow. Received May 10, 1922. Quoted notes by Mr. Skvortzow.

A collection of seeds from northern Manchuria.

55424 and 55425. AMARANTHUS spp. Amaranthaceæ.

Introduced for testing as possible sources of leaf vegetables for diabetics.

55424. AMARANTHUS CAUDATUS L.

The young leaves of this plant are used like spinach.

55425. AMARANTHUS PANICULATUS L.

The seeds of this plant are much used by Mexican Indians for making sweetmeats; the seeds are first roasted, then mixed with sirup made of honey or of sugar and water, rolled into balls, and eaten like sugared pop corn. The seeds are also ground and cooked in small cakes known as *alegría*, these cakes being eaten in large quantities by the poorer classes. (Adapted from *note of Mrs. Zelia Nuttall under S. P. I. No. 46310.*)

For previous introduction, see S. P. I. No. 54407.

55426. CORIANDRUM SATIVUM L. Apiaceæ. **Coriander.**

"A Chinese variety."

55427. FAGOPYRUM VULGARE Hill. Polygonaceæ. **Buckwheat.**

A medium-sized variety with brownish gray seeds.

55428. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

A reddish yellow variety with black hulls.

55429. ORYZA SATIVA L. Poaceæ. **Rice.**

"Water rice."

55430 to 55432. PHASEOLUS ANGULARIS (Willd.) W. F. Wight. Fabaceæ. **Adsuki bean.**

55430. Straw-colored variety.

55431. Small red variety.

55432. "From the Chinese market."

Large variety with mottled red and white seeds.

55433 and 55434. PHASEOLUS AUREUS Roxb. Fabaceæ. **Mung bean.**

55433. Seeds dull grayish green.

55434. "From the Chinese market."

Seeds bright green.

55424 to 55441—Continued.

55435 and 55436. PHLEUM spp. Poaceæ.

Introduced in connection with timothy-breeding experiments.

55435. PHLEUM ALPINUM L.

"Seeds of wild plants from the Ussuri district, Siberia."

55436. PHLEUM PRATENSE L. **Timothy.**

"From the Nicolsk-Ussurisk Agricultural Experiment Station."

Contains some *Phleum alpinum*.

55437 to 55441.

Introduced for forage-crop experiments.

55437. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

"Black soy beans."

55438 and 55439. VIGNA SESQUIPEDALIS (L.) Fruwirth. Fabaceæ. **Yard-Long bean.**

55438. Black variety. **55439.** Brown variety.

55440 and 55441. VIGNA SINENSIS (Torner) Savi. Fabaceæ. **Cowpea.**

55440. Seeds mottled with straw color and light chocolate.

55441. "From the market."

55442 and 55443.

From Foochow, China. Seeds presented by C. R. Kellogg. Received May 20, 1922.

55442. ALLIUM ODORUM L. Liliaceæ. **Onion.**

In Japan this onion is cultivated for its leaves, which are eaten as greens; in the spring the leaves are borne luxuriantly by the old bulbs, becoming about a foot in length. (Adapted from *Useful Plants of Japan, Agricultural Society, Tokyo, p. 17.*)

55443. MELASTOMA REPENS Desr. Melastomataceæ.

"A low perennial shrub which bears beautiful roselike flowers all summer long. The flowers last only one day, but because of their great number the shrub is always well covered. The fruits are said to be eaten, but have the lack of flavor so common in Chinese fruits." (*J. B. Norton.*)

For previous introduction, see S. P. I. No. 48718.

55444. HIBISCUS ROSA-SINENSIS L. Malvaceæ.

From Manila, Philippine Islands. Cuttings presented by H. H. Boyle, Manila, through the Bureau of Agriculture. Received May 25, 1922.

White Gumamela. A white variety of the well-known and exceedingly variable Chinese hibiscus.

55445. CASIMIROA TETRAMERIA Millsp. Rutaceæ. **Matasano.**

From Tegucigalpa, Honduras. Seeds presented by G. K. Donald, American consul. Received May 27, 1922.

A Central American tree about 30 feet in height, with pale warty branches, digitate leaves about 8 inches long, and axillary panicles of greenish flowers. The edible fruit, approximately the size of an orange, has a green skin with spiny protuberances sparsely scattered over the surface; the white or yellow flesh is sweet or slightly sour and incloses two or three large black seeds. (Adapted from *Field Museum of Natural History, Chicago, Publications, Botanical Series, vol. 1, p. 401.*)

This species has fruited in the Miami Plant Introduction Garden and its large attractive fruits prove it to be one worthy of serious study by Florida horticulturists.

For previous introduction, see S. P. I. No. 21030.

For illustrations of a white sapote and its fruits, see Plates I and II.

55446. MEIBOMIA RENSONI Painter. Fabaceæ.

From San Salvador, Salvador. Seeds presented by Dr. Carlos Renson, Director del Laboratorio Químico. Received May 23, 1922.

"These seeds gave a perfect germination in from 4 to 10 days." (*Renson.*)

The *barajillo* is a rapidly growing shrub, native to the Republic of El Salvador at altitudes ranging from 2,000 to 4,000 feet. Under favorable conditions it sometimes becomes a small tree about 18 feet high. The trifoliolate leaves are softly hairy and up to 3½ inches in length, and the small purplish flowers are borne in terminal racemes late in October. The roots of the *barajillo* are very large and penetrate deeply into the soil; the tubercles formed by the nitrogen-gathering bacteria are usually found only on the upper third of the root. All kinds of cattle are exceedingly fond of this plant; furthermore, it is capable of enduring prolonged drought and of thriving in very poor soil. (Adapted from *Revista de Agricultura Tropical, El Salvador, vol. 1, p. 65.*)

For illustrations of the *barajillo*, see Plates III and IV.

55447. MICROCITRUS INODORA (Baill.) Swingle. Rutaceæ. **Russell River lime.**
(*Citrus inodorus* Baill.)

From Brisbane, Queensland. Seeds presented by C. T. White, Botanic Museum and Herbarium, Botanic Gardens. Received May 25, 1922.

In general appearance the Russell River lime resembles the orange, having the same dark-green foliage. The very small white flowers are odorless, and the oval or oblong ribbed fruits are about 2½ inches long, with pulp having a sharp but agreeable flavor. This tree is native to the Bellenden Ker Mountain region of northern Queensland and is the only species of the genus which yields fruits of sufficiently good quality to be of promise for culture even without any improvement by cross-breeding or selection. (Adapted from *Swingle, Journal of the Washington Academy of Sciences, vol. 5, p. 577,* and from *Bailey, Report of the Government Expedition to Bellenden Ker Range, p. 34.*)

55448 to 55450. CERATONIA SILIQUA L. Cæsalpiniaceæ. **Carob.**

From Jerusalem, Palestine. Cuttings presented by I. Wilkanski, Jewish Agricultural Experiment Station. Received May 25, 1922. Quoted notes by Mr. Wilkanski.

55448. "*Habathi.* This is poorer in quality than the other two varieties, but gives a larger crop."

55449. "*Sandalawi.* This is the best variety as far as quality is concerned."

55450. "*Schehabi.* This is quite mediocre both in quality and yield."

55451 to 55453. GOSSYPIUM spp. Malvaceæ. **Cotton.**

From Bela Vista, Angola, Africa. Seeds presented by H. A. Neipp, American Mission. Received May 19, 1922. Quoted notes by Mr. Neipp.

55451. GOSSYPIUM sp.

"Collected in dry season at 5,400 feet altitude."

55452. GOSSYPIUM sp.

"Collected during the wet season at 5,400 feet altitude."

55453. GOSSYPIUM sp.

"Collected in Lobito, sea level."



ONE OF THE WHITE SAPOTES OF CENTRAL AMERICA. (CASIMIROA TETRAMERIA MILLSP.; S. P. I. No. 55445.)

The common white sapote (*Casimiroa edulis*) has been cultivated in California for many years. The species here shown, *C. tetrameria*, is of more recent introduction and has not yet become well known in this country. At Miami, Fla., it grows lustily and produces in great abundance its yellow-green fruits, whose pale yellow flesh is of very sweet flavor with a bitter tang. *Casimiroa tetrameria* can be distinguished from *C. edulis* by its more pubescent leaves. The fruits of the two species are almost identical in character. (Photographed by Edward Simmonds, Plant Introduction Garden, Miami, Fla., October, 1921; P27983FS.)



A RARE SPECIES OF WHITE SAPOTE. (CASIMIROA TETRAMERIA MILLSP.; S. P. I. No. 55445.)

When fully ripe, the fruits of this rare white sapote are very soft and delicate in texture and must be handled with care to avoid bruising. They are usually eaten out of the hand and are highly interesting because of the peculiar combination of sweet and bitter flavors which they possess. The tree can be grown in many parts of California and Florida. It resists severe frosts and requires less water than many other fruit trees. (Photographed by E. L. Crandall, Photographic Laboratory, May 24, 1921; P26849FS.)



THE BARAJILLO, A NEW LEGUMINOUS SHRUB FROM SALVADOR. MEIBOMIA RENSONI PAINTER; S. P. I. No. 55446.)

The use of leguminous plants as green cover crops and soil builders is becoming universal. The one here shown, *Meibomia rensoni*, has recently been called to the attention of horticulturists by Dr. Carlos Renson, of San Salvador. Under favorable conditions of climate and soil it reaches 18 feet in height. Its purplish flowers are borne in terminal racemes. The large roots penetrate deeply into the soil. Like other leguminous plants, *M. rensoni* gathers nitrogen from the air and stores it in nodules upon the smaller roots. (Photographed by Dr. Carlos Renson, San Salvador, Salvador.)



YOUNG BRANCHES OF THE BARAJILLO. (MEIBOMIA RENSONI PAINTER; S. P. I. No. 55446.)

This new leguminous shrub from Salvador, in addition to serving as a green cover crop, is said to be an excellent forage for livestock. The plant thrives in poor soil and is said to resist drought admirably. It should be tried in tropical regions, where it may prove to be more valuable than the pigeon-pea, now used extensively as a cover crop and soil builder. (Photographed by Dr. Carlos Renson, San Salvador, Salvador.)

55454 and 55455. GARCINIA spp. Clusiaceæ.

From Santa Fe, Isle of Pines. Seeds presented by H. S. Jones. Received May 27, 1922.

Introduced for testing as a stock for the mangosteen (*Garcinia mangostana* L.).

55454. GARCINIA TINCTORIA (DC.) W. F. Wight.
(*G. xanthochymus* Hook. f.)

A medium-sized tree, native to southern Asia, with smooth, bright-yellow, strongly acid fruits the size of an orange.

For previous introduction, see S. P. I. No. 47358.

55455. GARCINIA sp.

Fruits yellow, about 2 inches in diameter.

55456 to 55462. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From Ibarra, Ecuador. Tubers presented by Sr. José Felix Tamayo. Received May 29, 1922.

"These varieties of *Chaucha* potatoes were grown near Ibarra, Ecuador. The *Chauchas* (Quichua, early) are a group of potatoes cultivated in the Ecuadorian highlands at altitudes between 8,000 and 12,000 feet. Commercially they are not very important, due to the fact that they do not keep as well as other varieties, but they are much cultivated for home use. The tubers are of good size; those of some varieties are of good quality, while others are rather inferior. The color, both of surface and flesh, is variable.

"The *Chauchas* mature in about five months from the time of planting, when cultivated at an elevation of 12,000 feet; other varieties require seven to eight months. As soon as the plants come into bloom the tubers are considered to be mature and are dug for eating. Unlike other varieties, which must be dug and then stored for a period before resowing, the *Chauchas* can be resown immediately after digging. The yield is fairly heavy, but not as great as that of some of the late-maturing varieties." (*Wilson Popenoe.*)

55456. (No. 1.)
55457. (No. 2.)
55458. (No. 3.)
55459. (No. 4.)
55460. (No. 5.)
55461. (No. 6.)
55462. (No. 7.)

55463. CUCURBITA PEPO L. Cucurbitaceæ. **Squash.**

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. Received May 31, 1922.

Introduced in connection with experiments to determine the specific identity of our cultivated pumpkins and squashes.

Courge de Mirepoix. (Mirepoix Musk squash.) A variety cultivated in southern France, with a strong trailing stem, large erect leaves with rounded lobes, and pear-shaped, slightly ribbed fruits which are dark green, streaked with light green. The flesh is dark red, firm, and fragrant. (Adapted from *Robinson, The Vegetable Garden, p. 327.*)

55464. CERATONIA SILIQUA L. Cæsalpiniaceæ. **Carob.**

From Chaseki, Athens, Greece. Presented by P. O. Anagnostopoulos, director, Horticultural Station. Received May 27, 1922.

Cuttings of a variety of carob, grown near Athens, Greece. Obtained at the request of Dr. J. Eliot Coit, of Los Angeles, who has been in correspondence with Mr. Anagnostopoulos, and who believes that the variety may be a superior one for cultivation in California, where the carob is receiving serious attention.

55465. Oncoba echinata Oliver. Flacourtiaceæ. Gorli.

From Sierra Leone, Africa. Purchased from L. A. King-Church, conservator of forests, Freetown, Sierra Leone. Received June 1, 1922.

"The commercial sources of chaulmoogra oil and some closely related products which yield chaulmoogric and hydnocarpic acids have always been and still are the seeds of forest trees (*Taraktogenos kurzii, Hydnocarpus anthelminthica*, and *H. wightiana*, and possibly others) growing in the rain-forest regions of British India and Siam. It has, however, been observed by Goulding and Akers that the seeds of a West African shrub, *Oncoba echinata*, yield an oil which contains a large proportion of chaulmoogric acid.

"Through the explorations of J. F. Rock, of this office, seeds of the forest trees (*Taraktogenos kurzii, Hydnocarpus anthelminthica, H. wightiana*, and *H. castanea*) have been secured and plants obtained from them are now being grown in various countries. Inasmuch as these are all tall trees, considerable time would doubtless be required for the production of fruit. On account of this fact a search has been made for more rapidly maturing plants which yield chaulmoogric acid, and through the kindness of L. A. King-Church, conservator of forests of Sierra Leone, a considerable quantity of seeds of the *gorli* shrub (*Oncoba echinata*) has been secured.

"Since the investigations of Goulding and Akers (see Proceedings of the Chemical Society of London, vol. 29, No. 417, p. 197) of the Imperial Institute, have established the fact that *gorli* seeds yield 45.6 per cent of fat and that the mixed fatty acids obtained from this consist to the extent of 87.5 per cent of chaulmoogric acid, the importance of making an attempt to get the plant and cultivating it was pointed out by Dr. Frederick B. Power in his chapter in Mr. Rock's bulletin entitled: 'The Chaulmoogra Tree and Some Related Species,' p. 8 (U. S. Department of Agriculture Bulletin No. 1057).

"From the literature relating to the genus Oncoba it appears that it is composed of shrubs or small trees; that there are several species, all of them African, and that they bear fruits of considerable size. *Oncoba echinata*, for example, has fruits remembling in size and shape an unopened chestnut bur. That these shrubs are precocious is indicated by the fact that one species, *Oncoba routledgii*, flowered in England two years from seed. This won a certificate from the horticultural society on account of the conspicuous beauty of its large white flowers, which are 2 or 3 inches in diameter.

"Whether *Oncoba echinata* is especially particular as to its soil requirements remains to be determined, but, judging from the experience which we have had with other trees and shrubs from Natal and other portions of Africa, there would seem to be a fair chance that it might thrive even on the limestone soils of southern Florida." (*David Fairchild.*)

55466 and 55467. Avena sativa L. Poaceæ. Oats.

From Cambridge, England. Seeds presented by Prof. R. H. Biffen, Cambridge School of Agriculture. Received May 24, 1922.

These two new hybrid varieties of *white winter* oats were originated at the Plant-Breeding Institute, Cambridge, England, and are introduced for the use of oat breeders in this country.

55466. *A. 69.* 55467. *A. 147.*

55468 and 55469.

From Oxkutzcab, Yucatan, Mexico. Seeds presented by Sr. Moises Vasquez Vega. Received May 29, 1922.

55468. Carica papaya L. Papayaceæ. Papaya.

"The fruits are very large, weighing from 17 to 22 pounds." (*Vega.*)

For previous introduction, see S. P. I. No. 52620.

55469. Jacaratia mexicana A. DC. Papayaceæ.

A relative of the papaya (*Carica papaya* L.), introduced for breeding experiments.

"A tree with a smooth, tapering trunk and many slender branches. The leaves are palmately seven parted and the fruits, about 6 inches

55468 and 55469—Continued.

long, are five winged, each wing terminating in an incurved spur at the base. These sweetish edible fruits are preserved with sugar. The tree is commonly called *bonete* or *papaya silvestre* and occurs in Yucatan and Chiapas, Mexico, and other parts of tropical America." (*W. E. Safford.*)

55470. AMYGDALUS PERSICA × COMMUNIS. Amygdalaceæ. **Peach-almond hybrid.**

From Mexico, D. F., Mexico. Seeds presented by Prof. Juan Balme. Received June 1, 1922.

The peachmond, a supposed peach-almond hybrid, interesting to those engaged in breeding stone fruits.

55471. CHENOPODIUM QUINOA Willd. Chenopodiaceæ. **Quinoa.**

From Cuzco, Peru. Seeds presented by Dr. Alber A. Giesecke, Cuzco University. Received June 1, 1922.

For previous introduction and description, see S. P. I. No. 55051.

55472 to 55475. CAPSICUM ANNUUM L. Solanaceæ. **Red pepper.**

From Valencia, Spain. Seeds presented by Henry C. A. Damm, American consul. Received June 10, 1922.

55472. *Paprika* No. 1.

55473. *Paprika* No. 2.

55474. *Pimiento largo dulce de España.*

55475. *Pimiento Morron.*

For previous introduction, see S. P. I. No. 32370.

55476. PRUNUS MAJESTICA Koehne. Amygdalaceæ. **Cherry.**

From Kingtungting, Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received June 2, 1922.

"(No. 2967. Manoh, Yunnan. March 30, 1922.) A large, handsome tree, 40 to 50 feet in height, with large green leaves and oblong, bright-red, bitter, fleshy fruits. It grows at altitudes of 6,000 feet on ridges with *Pyrus yunnanensis* and is very drought resistant, enduring drought for seven months or more. Also it can withstand the intense heat of April and the freezing temperatures of winter. It is a prolific bearer, but is useful only as a stock plant and as an ornamental." (*Rock.*)

55477. NAGEIA NAGI (Thunb.) Kuntze. Taxaceæ.
(*Podocarpus nagi* Pilger.)

From Okitsu, Shizuokaken, Japan. Seeds presented by T. Onda, director, Government Horticultural Experiment Station. Received June 2, 1922.

An evergreen subtropical tree 30 to 60 feet high, with very narrow, bluish green, sharp-pointed leaves about 3 inches long arranged in two rows on the branches. The fruit is a small, fleshy, purplish black drupe which emits a balsamlike fragrance when cut. In Japan, where this tree is native, the white, fine-grained wood is used for furniture and general building. Propagation is easily carried on by seeds, of which the tree produces an abundance. (Adapted from *Useful Plants of Japan, Agricultural Society, Tokyo, p. 145,* and *Revue Horticole, vol. 86, p. 77.*)

55478. SALPICHROA RHOMBOIDEA (Gill. and Hook.) Miers. Solanaceæ.

From Buenos Aires, Argentina. Seeds presented by Sr. Benito Carrasco, director, Botanic Garden. Received June 2, 1922.

Introduced for use in tomato-breeding experiments.

An ornamental relative of the tomato, with white flowers and edible, white, transparent berries which resemble the pineapple in flavor. Because of its attractive appearance and creeping habit it is very effective for covering bare places. (Adapted from *The Garden, vol. 35, p. 367.*)

55479. AVENA NUDA Hoejer. Poaceæ. **Naked oats.**

From Min Hsien, Kansu, China. Seeds presented by William H. Ruhl. Received June 2, 1922.

"This is the variety of huskless oats grown in the Province of Kansu." (*Ruhl.*)

55480. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Sydney, New South Wales. Presented by George Valder, undersecretary and director, New South Wales Department of Agriculture. Received June 12, 1922.

Locally grown timothy seed introduced for cultural and comparison experiments.

55481. HIBISCUS CANNABINUS L. Malvaceæ.

From Pusa, Bengal, India. Seeds presented by A. Howard, Imperial economic botanist, through Robert S. Finlow, fiber expert to the Government of Bengal. Received June 3, 1922.

Introduced for trial as a fiber-producing plant.

A prickly stemmed plant 6 to 8 feet in height, cultivated throughout India for its fiber, which is used as a substitute for hemp. The fiber is soft, white, and silky and is considered by some authorities to be more durable than jute for coarse textiles. (Adapted from *C. R. Dodge, Useful Fiber Plants of the World, p. 192.*)

55482. DIOSCOREA CAYENENSIS Lam. Dioscoreaceæ.

From Guantanamo, Cuba. Tuber collected at Baltimore, Md., by C. E. Prince, inspector, Federal Horticultural Board. Received June 3, 1922.

"A yellow-fleshed yam having a somewhat bitter taste, but otherwise of very good quality. The vine is dark green and thorny." (*R. A. Young.*)

55483. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

From Naples, Italy. Seeds presented by the Italian School of Agriculture at Portici, through Homer M. Byington, American consul. Received June 3, 1922.

"*King Humbert.* This belongs to the group of tomatoes used by the Italians for making tomato paste. The fruits are pear shaped. The vine is very vigorous and quite productive." (*D. N. Shoemaker.*)

Introduced for the use of specialists in tomato breeding.

55484. JUNIPERUS PROCERA Hochst. Pinaceæ. **East African cedar.**

From Jamaica Plain, Mass. Seeds presented by Prof. C. S. Sargent, Arnold Arboretum, Harvard University. Received June 3, 1922.

"This is probably the largest and handsomest juniper in the world. It is a native of the high mountains of eastern tropical Africa and should prove an extremely valuable tree in the mountains of the West Indies; it may grow in the southern United States." (*Sargent.*)

55485. ZIZIPHUS MAURITIANA Lam. Rhamnaceæ. **Indian jujube.**
(*Z. jujuba* Lam., not Mill.)

From Assam, India. Seeds presented by S. K. Mitra, economic botanist. Received June 5, 1922.

The Indian jujube is cultivated chiefly for its fruit, which varies in shape from more or less spherical in the wild or commoner kinds to oval or oblong in the cultivated kinds. The pulp is mealy and pleasantly sweetish; some of the cultivated varieties are very fine. The tree is found throughout India. (Adapted from *Brandis, Forest Flora of India, p. 88.*)

For previous introduction, see S. P. I. No. 41443.

For an illustration of this jujube, see Plate V.

55486. ACANTHOSICYOS HORRIDA Welw. Cucurbitaceæ.

From Pretoria, Union of South Africa. Seeds presented by Dr. I. B. Pole Evans, through Dr. H. L. Shantz, physiologist in charge of the Office of Plant Physiological and Fermentation Investigations. Received June 5, 1922.

"*Narras.* A remarkable cucurbitaceous plant which grows on the dunes of the Namib, where subterranean waters exist. Even when this water is at great depths this plant subsists. It forms thorny thickets on the sand hills of Southwest Africa and is adapted to a hot, dry climate, with little or no rainfall. The fruit is the size of an ostrich egg. Both the pulp and seeds are used as food by the natives. The fruits are produced in abundance, and for about four months of the year the more primitive Hottentots are said to survive with practically no other source of food or water. The fruits are eaten and water is secured from them. The seeds when ripe are plump and about the size of watermelon seeds.

"The plant is one which should be of great value to our Indians of the Southwest if once established on the sand dunes of Arizona and southern California. It is doubtful if any plant can be secured which seems offhand to give greater promise in that region than does this cucurbit." (*Shantz.*)

For previous introduction, see S. P. I. No. 31401.

55487. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

From Santa Ines, Chile. Plants presented by Sr. Salvador Izquierdo, Santiago, Chile. Received June 12, 1922.

"*Pomona Improved.* Sr. Izquierdo writes that this is an improved form of the variety Pomona, grown at his nursery at Santa Ines. Preserved fruits which he has sent us to show the character of the variety indicate that it is a fruit of unusually large size, deep yellow, clingstone, and of excellent quality for canning. It should be tried in California, where it may prove to have real value. Its season of ripening is not known." (*Wilson Popenoe.*)

55488. MEDICAGO SATIVA L. Fabaceæ.

From Loja, Ecuador. Seeds presented by Sr. Enrique Witt. Received June 15, 1922.

Locally grown seed introduced for experiments in alfalfa breeding.

55489. ILEX PARAGUARIENSIS St. Hil. Aquifoliaceæ. **Yerba maté.**

From Buenos Aires, Argentina. Presented by D. S. Bullock, agricultural commissioner, Bureau of Markets and Crop Estimates, United States Department of Agriculture. Received June 5, 1922.

"These seeds were harvested in April in the Territory of Misiones." (*Bullock.*)

A small, bushy, evergreen tree with serrate alternate leaves, native to Brazil and Paraguay and the neighboring countries. The leaves are roasted and ground to make the Paraguay tea of commerce, which is said to possess the good properties of tea and coffee without their injurious after effects.

For previous introduction, see S. P. I. No. 47309.

55490 and 55491. LENTILLA LENS (L.) W. F. Wight. Fabaceæ.
(*Lens esculenta* Moench.) **Lentil.**

From Malaga, Spain. Seeds presented by Sr. Luis Liro Ortiz, Ingeniero de la Sección Agronómica Málaga, through Gaston Smith, American consul. Received June 12, 1922.

55490. From Arevalo, Province of Avila.

55491. From the Province of Salamanca.

55492. DIOSCOREA ALATA L. Dioscoreaceæ. **Greater yam.**

From the Bahama Islands. Tuber collected at New York by Federal Horticultural Board inspectors. Received June 8, 1922.

"Tuber of an unidentified variety of the greater yam for testing in Florida and the Gulf region. The vine is four angled and prominently winged, with the margins of the wings purplish. The central part of the young leaf has purplish shading between the veins." (*R. A. Young.*)

55493. ILEX PARAGUARIENSIS St. Hil. Aquifoliaceæ. **Yerba maté.**

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. Received June 7, 1922.

For previous introduction and description, see S. P. I. No. 55489.

55494. RUMEX TUBEROSUS L. Polygonaceæ. **Sorrel.**

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received June 2, 1922.

"A very good sorrel from the Atlas region of Algeria." (*Trabut.*)

"The leaves are often used as a vegetable." (*Dragendorff, Die Heilpflanzen, p. 190.*)

55495. SEVERINIA BUXIFOLIA (Poir.) Ten. Rutaceæ.
(*Atalantia buxifolia* Oliver.)

From Buitenzorg, Java. Seeds presented by the director of the Botanic Garden. Received June 5, 1922.

A much-branched thorny shrub which is not uncommon in southern China and French Indo-China; it has oval, shiny green leaves, axillary clusters of small white flowers, and small berrylike fruits which become very dark red or nearly black. In Louisiana this handsome shrub has proved useful for hedges, especially the forms which have thorns 2 or 3 inches long; furthermore, it is easily propagated from cuttings. Experiments have shown that Severinia can withstand unusually large amounts of salt in the soil, and it may prove of interest for citrus fruits in regions having alkali in the soil or salty irrigation water. (Adapted from *Swingle, Journal of the Washington Academy of Sciences, vol. 6, p. 651.*)

55496. GARCINIA MANGOSTANA L. Clusiaceæ. **Mangosteen.**

From Peradeniya, Ceylon. Plants presented by Dr. F. A. Stockdale, Director of Agriculture for Ceylon, through Mrs. Arthur Curtis James. Received June 5, 1922.

"In the hope of establishing the mangosteen in our tropical dependencies, many importations of seeds and plants have been made during the last 20 years. Indeed, the office has made it a point never to miss an opportunity to secure new stock, whether in the form of a shipment of seeds by parcel post or a wardian case of young plants which some traveler returning from the East has generously volunteered to bring home. This lot of plants which Mrs. Arthur Curtis James secured from the Botanic Garden at Peradeniya, Ceylon, and which she has carefully brought with her on the deck of the yacht *Aloha*, was presented by Dr. F. A. Stockdale, Director of Agriculture for Ceylon." (*Wilson Popenoe.*)

For description of the mangosteen, see S. P. I. No. 51465.



A JUJUBE FOR MOIST TROPICAL REGIONS. (ZIZIPHUS MAURITIANA LAM.: S. P. I. No. 55485.)

The Chinese jujube (*Ziziphus jujuba*) is being cultivated with great success in California and the Southwestern States. It is not successful, however, in southern Florida or in humid tropical regions generally. *Ziziphus mauritiana*, on the other hand, grows and fruits well at the Plant Introduction Garden, Miami, Fla., and will probably be suitable for cultivation in Porto Rico, Hawaii, and the Philippines. It is a small tree of attractive appearance, and its greenish yellow fruits, here illustrated in natural size, when stewed are scarcely distinguishable from the best northern plums. (Photographed by E. L. Crandall, Photographic Laboratory, February 7, 1922; P27245FS.)



BARBADOS RED, A GOOD VARIETY OF TROPICAL YAM. (DIOSCOREA ALATA L.; S. P. I. No. 55561.)

This is a horticultural form of *Dioscorea alata*, technically known as the greater yam. It is widely grown in the West Indies and is closely related to the Dago haya, or Guam yam. It is, however, better than the latter in some respects. The tuber has a purple inner skin, and the firm flesh, mealy when cooked, is purplish and of good flavor. The yam replaces the potato in certain tropical regions and in its best varieties is fully equal to the latter; indeed, good yams properly cooked can hardly be distinguished from potatoes. (Photographed, natural size, by E. L. Crandall, Photographic Laboratory, June 23, 1922; P27585FS.)

55497 to 55499.

From Talifu, Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received June 18, 1922. Quoted notes by Mr. Rock.

55497. PYRUS sp. Malaceæ. Pear.

"(Talifu, Yunnan. April 18, 1922.) An edible pear about the size of a large apple; the flesh is light yellow, and the skin is thin, firm, and light citron colored with a red hue, hence the name *Wu pa li*, 'touched-by-the-fire' pear. The tree grows on the side of the lake opposite to Talifu."

55498. PRUNUS MAJESTICA Koehne. Amygdalaceæ. Cherry.

"(No. 3066. Near Chukai, Yunnan. April 5, 1922.) A lovely tree with large serrate leaves; the branches were bent with their load of large, oblong, deep-red, cherrylike fruits. It is early fruiting, the fruits appearing in late February or early in March, and the tree seems to be absolutely free from insect or fungous pests. It occurs throughout the Black River Valley at altitudes of about 5,000 feet on mountain slopes, also near Szemao, where it is rare, and more commonly near Nanchien. The Chinese name is *Yin to* or *Yin tao*."

55499. RUBUS ELLIPTICUS J. E. Smith. Rosaceæ. Raspberry.
(*R. flavus* Buch.-Ham.)

"(Nanchien, Yunnan. April 8, 1922.) A very stout shrub which, especially when young, is densely covered with long, red, almost hairlike spines. The flowers are white, and the deep-yellow, almost orange, very juicy acid fruits are collected by the hill tribes and brought to the markets; the fruits ripen earlier on the mountains than in the valley. The shrub is found at altitudes of 6,000 to 7,000 feet all the way up to Talifu; it grows on the high hills near Szemao, and I also came across it in Kengtung."

55500 and 55501.

From Nanchien, Yunnan, China. Cuttings collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received June 13, 1922. Quoted notes by Mr. Rock.

55500. PRUNUS MAJESTICA Koehne. Amygdalaceæ. Cherry.

"(Szemao, Yunnan, March 18, 1922.) These seeds were sent to me at Talifu from the mountains near Szemao; they are said to be from the first wild edible cherries which came to the market."

55501. SACCHARUM OFFICINARUM L. Poaceæ. Sugar cane.

"(Nanchien, Yunnan. April 27, 1922.) The cane is erect, tall, of a uniform reddish yellow color, and very juicy and sweet. It is cultivated throughout the central portion of Yunnan, south of Mengwa, and also near Puerhfu, in southern Yunnan; it is grown at an altitude of 5,000 to 6,000 feet and even higher. The region is very dry, and arid mountains form the slopes of the valleys."

55502. TRIFOLIUM PRATENSE L. Fabaceæ. Red clover.

From Valence sur Rhone, France. Seeds purchased from Tezier Frères. Received June 17, 1922.

Medium red clover seed introduced for comparison and cultural experiments.

"This seed is from the 1921 harvest and was grown about 8 kilometers (about 5 miles) east of Valence." (*Tezier Frères.*)

55503. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. Tomato.

From Buenos Aires, Argentina. Seeds presented by D. S. Bullock, agricultural commissioner, Bureau of Markets and Crop Estimates, United States Department of Agriculture. Received June 15, 1922.

Perfección. Introduced for the use of specialists of this bureau who are engaged in tomato-breeding experiments.

55504. TELFAIRIA PEDATA (J. E. Smith) Hook. Cucurbitaceæ. **Koume vine.**

From Nairobi, Kenia, Africa. Seeds presented by A. Holm, director, Department of Agriculture. Received June 6, 1922.

"A perennial climber, indigenous to eastern Africa, which grows very luxuriantly in this colony. The kernels of the seeds are used by the natives both as a foodstuff and as a source of edible oil.

"The following analysis of the seeds has been published by Gilbert (see Sadebeck, Die Kulturgewächse der Deutschen Kolonien und Ihre Erzeugnisse, Jena, 1899, p. 245):

	Per cent.
Moisture	6.54
Ash	2.04
Oil	36.02
Protein	19.63
Woody fiber	7.30
Nitrogen-free extractive matter	28.45

"These seeds are flat, irregularly circular in shape, and about 1¼ to 1½ inches in diameter. The single seeds average 4.9 grams in weight.

"The Imperial Institute of London has reported as follows:

"'The seeds consist approximately of fibrous husk 11 per cent, shell 38 per cent, and kernel 51 per cent.'

"The kernel yields 56.9 per cent of slightly reddish brown oil.

"The oil from seeds from Zanzibar gave the following analysis:

Specific gravity at 15° C	0.919
Acid value	2.6
Saponification	196
Iodin value	89

"This is a nondrying oil and has a pleasant, slightly sweet taste. It would be suitable for soap manufacture and also as an edible oil. The seed is used by Europeans in this colony both as a nut and as a flavoring for cakes.

"The reason that these seeds are not more used is due to the hardness of the shell and the difficulty of removing it, as well as to the intensely bitter, green skin which separates the kernel from the shell. If a method could be found of removing the tough fibrous husks and this bitter skin, it would appear that the seed would be of considerable commercial value, both for its edible oil and for the manufacture of soap, as well as for the resultant oil cake, which would probably make a good cattle feed. It would be impossible, however, to use the cake after pressing the unhusked seeds, on account of the skin mentioned above.

"A German syndicate of soap and candle manufacturers at Mannheim has investigated the possibilities of these seeds, but expressed the opinion that it would be inadvisable to place consignments of the seeds on the European market until a machine had been invented for rapidly and cheaply shelling them.

"These seeds grow very rapidly in any place which is not touched by frost. The pod containing the seeds is about a foot in diameter when ripe. The vine climbs over neighboring trees and requires no care." (*S. W. Eels, American consul, Nairobi, Kenia.*)

For previous introduction, see S. P. I. No. 52450.

55505 to 55508. RUBUS spp. Rosaceæ. **Raspberry.**

From Slough, England. Plants purchased from Charles Turner, The Royal Nurseries. Received June 2, 1922.

55505. RUBUS sp.

Carter's Prolific. A moderately vigorous variety with spiny canes about 3 feet high and very small leaves; it is a good cropper, and the berries are medium sized, deep red, and nearly round, firm, and of good flavor. (Adapted from *Journal of the Royal Horticultural Society, vol. 47, p. 47.*)

55506. RUBUS sp.

"*Northumberland Fillbasket.* Large, deep-red fruits of good flavor." (*Dicksons's 1921–22 Catalogue.*)

55505 to 55508—Continued.

55507. RUBUS sp.

"*Perfection.* Very stout bright-crimson canes and large bright-red fruits of excellent flavor. A vigorous grower, thriving on light soils." (*George Bunyard's Catalogue.*)

55508. RUBUS sp.

"*The Guinea.* A new yellow variety of great excellence." (*Charles Turner's Catalogue.*)

For previous introduction, see S. P. I. No. 41976.

55509. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

Seedling now growing at the Plant Introduction Garden, Miami, Fla.

"*Collinson.* This is a seedling of the Collins Guatemalan avocado (S. P. I. No. 19080); it was planted at the new garden in 1915, endured well the frost of February, 1917, when the temperature went to 26° F., before a good crop of fruit in 1920 and 1921, and at this date (March 7, 1922) still has fruit on the tree. The tree is upright in habit, with large leaves which do not burn in the summer. This year the fruits are of better quality than before, the average weight being about 1¼ pounds; color, green; seed, tight in the cavity; flavor, good." (*Edward Simmonds.*)

55510 to 55515. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From Sydney, New South Wales. Tubers presented by George Valder, undersecretary and director, New South Wales Department of Agriculture, through W. D. Kerle, Inspector of Agriculture. Received June 17, 1922.

These are old varieties of American origin which are being cultivated in New South Wales. They have been reintroduced from New South Wales for special studies by potato experts. William Stuart, of the Bureau of Plant Industry, has furnished the descriptive notes from old American catalogues.

55510. *Adirondack.* This variety is a hybrid with *White Peachblow.* It is distinguished from the latter in its upright habit and larger bright-green leaves. The red-skinned, almost perfectly spherical tubers are much clustered; the flesh is pure white. (Adapted from *Potato Catalogue of B. K. Bliss & Sons, 1881, p. 5.*)

55511. *Brownell's Beauty.* The foliage is deep green and very healthy; the tubers grow compactly in the hill and are easily dug, ripening in about three months from the time of planting. The tubers are medium to large, oval or somewhat flattened with the eyes few and nearly even with the surface; the skin is reddish or deep-flesh color; the flesh is white, fine-grained, and very delicate. For the table, when baked or boiled, they are equal to the best. (Adapted from *Potato Catalogue of R. K. Bliss & Sons, 1874, p. 4.*)

55512. "*Carmen No. 1.* (Synonym *Rural New York No. 1.*) This is a seedling from seedlings raised through several generations. It belongs to the Green Mountain group. The vines are large, strong, healthy, and well branched. The flowers are white and abundant, but rarely producing seeds. The abundant tubers are large, broadly roundish, with rather shallow eyes, creamy white skin, and white flesh of very fine quality." (*Stuart.*)

55513. *Manhattan.*

55514. *Manhattan Black.* This is a main-crop variety and may be called "Improved Compton's Surprise." The vines are vigorous, with dark-green foliage; the tubers are nearly round, with dark-purple skin and very solid white flesh of fine grain; in size medium to large. (Adapted from *Potato Catalogue of B. K. Bliss & Sons, 1880, p. 18.*)

55510 to 55515—Continued.

55515. *Queen of the Valley.* The vines are large and unusually vigorous, resisting disease well; the leaves are large, thick, and dark green. The very large tubers are long-flattened, but because of their large size are less suitable for table use than for feeding livestock. (Adapted from *Potato Catalogue of B. K. Bliss & Sons, 1881, p. 9.*)

55516. Fragaria sp. Rosaceæ. Strawberry.

From Irapuato, Guanajuato, Mexico. Plants sent by Juan Lopez Comaremy, Irapuato, at the request of Arthur Stockdale, Mexico City. Received June 20, 1922.

For previous introduction and description, see S. P. I. No. 54976.

55517 to 55519. Medicago sativa L. Fabaceæ. Alfalfa.

From Lima, Peru. Seeds presented by Dr. W. E. Dunn, acting commercial attaché. Received May 10, 1922.

Peruvian alfalfa has proved of great value in certain parts of the United States. In the hope of securing new strains which may be superior in certain respects to any now grown in the United States, an effort is being made to obtain seed from as many different regions in Peru as possible. The following note is taken from H. L. Westover, The Development of the Peruvian Alfalfa Industry in the United States, Department Circular 93:

"As compared with common alfalfa, both the Peruvian and 'smooth Peruvian' alfalfas are more upright, less branched, and have fewer and somewhat coarser stems and smaller crowns. In thick stands, these differences are hardly noticeable. Most of the Peruvian introductions are also characterized by rapid growth, quick recovery after cutting, and in sections having a mild climate ability to make growth in cool weather after ordinary alfalfas have ceased growing. Under such conditions the former starts growth earlier in the spring and continues later in the fall, thereby giving more cuttings each season. The principal objection advanced in times past to these alfalfas is their tendency to become somewhat woody when allowed to stand beyond the flowering stage, but this difficulty is easily obviated by harvesting earlier.

"Lack of hardiness will always confine the successful production of the true and smooth Peruvian alfalfas to the southern and southwestern portions of the United States, where the climatic conditions are comparatively mild. They can not be grown to advantage where the winter temperature falls below 10° F.

"At the present time most of the Peruvian and smooth Peruvian alfalfa in the United States is found in Arizona and California. It has also been grown to a limited extent in New Mexico, Texas, and the coastal regions of the Southeastern States. The results secured seem to indicate that in much of this region the common alfalfa could be replaced very profitably by Peruvian alfalfa."

55517. *Monsefu Norte.*

55518. *Quebrada de Tangas.*

55519. *Sierra Alta.*

55520 to 55547.

From Ariana, near Tunis, Africa. Seeds presented by F. Boeuf, chief, Botanical Service of Tunis. Received May 31, 1922.

55520 to 55524. Avena sterilis L. Poaceæ. Oats.

55520. *Crème.*

55521. *Grise.*

55522. *Hybride.*

55523. *Noire.*

55524. *Rousse.*

55525 to 55527. Hordeum vulgare pallidum Seringe. Poaceæ. Barley.

55525. *Fourragère.*

55526. *Commune A.*

55527. *Commune J.*

55520 to 55547—Continued.

55528. LOLIUM MULTIFLORUM Lam. Poaceæ. Italian rye-grass.

"Italian rye-grass is used to a limited extent for meadow, pasture, and lawn and in the South is of some importance for winter forage" (*A. S. Hitchcock.*)

55529 to 55546. TRITICUM DURUM Desf. Poaceæ. Durum wheat.

55529. *Adjini.*	**55538.** *Mahmoudi AC* 3.
55530. *Agili.*	**55539.** *Mahoudi AP* 5.
55531. *Agiliblanc* (No. 1).	**55540.** *Medea.*
55532. *Agiliblanc* (No. 2).	**55541.** *Mekki* 1.
55533. *Aouedj.*	**55542.** *Mekki* 2.
55534. *Derbessi.*	**55543.** *Souri AC* 60.
55535. *Biskri.*	**55544.** *Souri AP* 5.
55536. *Hamira.*	**55545.** *Sbei* 1.
55537. *Jenah Rhetifah.*	**55546.** *Sbei* 2.

55547. VICIA MICHAUXII Spreng. Fabaceæ. Vetch.

Introduced for trial as green manure and as a forage plant.

A creeping or climbing annual vetch, native to Syria, with very narrow leaflets, light-yellow flowers, and hairy pods about an inch long. (Adapted from *Post, Flora of Syria, Palestine, and Sinai, p. 288.*)

55548. ORNITHOPUS SATIVUS Brot. Fabaceæ. **Serradella.**

From Hamburg, Germany. Seeds purchased from Ernst & Von Spreckelsen. Received June 20, 1922.

Introduced for testing as a winter forage crop in the South.

For previous introduction, see S. P. I. No. 39345.

55549. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

From Eastwood, New South Wales. Plants purchased from C. E. Vessey, Mount Tomah Nurseries, through H. R. Wright, Avondale, Auckland, New Zealand. Received June 20, 1922.

"*Goodman's Choice.* We have sent out a number of letters to friends who are in a position to know the behavior of this peach and its comparison with *Phillips Cling.* So far we have only two replies, one from Mr. Goodman, who states that this is easily the best-quality canning peach the canners have ever seen, and that growers in this State (Victoria) are putting in more acres of it than all other yellow clings put together.

"His catalogue description, quoted below, shows that it ripens about six weeks later than *Tuscan Cling:*

"'Undoubtedly the greatest yellow-fleshed clingstone peach introduced for many years. The tree is a heavy bearer each season of medium-sized fruit that is admirable for canning. The skin has a red blush on the sunny side; the flesh is beautifully rich and translucent; the variety is remarkable for even crops and gradual ripening, which means so much when the picking campaign is in progress. The fruit ripens toward the end of February and, as the name indicates, represents my choice for canning.'

"We know the behavior of the clings generally in this State, and we find that they have a great tendency to be uneven in shape. Our own nurseyman states that *Goodman's Choice* is one of the best late peaches that he has come across, but as we have no growers for canneries around there we can not give an authoritative report from that point of view ourselves." (*Herbert J. Rumsey, Dundas, New South Wales.*)

55550. PYRUS sp. Malaceæ. **Pear.**

From Talifu, Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received June 27, 1922.

"(Talifu, May 4, 1922.) Seeds of a domesticated pear, from Haitung, on Lake Erh Hai, about 10 miles from Talifu." (*Rock.*)

55551. HORDEUM VULGARE PALLIDUM Seringe. Poaceæ. **Barley.**

From Valparaiso, Chile. Seeds purchased from S. Reid Thompson, American vice consul in charge. Received June 20, 1922.

"In Chile *Forjara* barley is cut twice for hay, and after that a third crop gives a good yield of grain. If this barley would give similar results in Oregon it would be of very great value." (*F. C. Reimer, Oregon Agricultural College Experiment Station.*)

55552 and 55553.

From Buitenzorg, Java. Seeds presented by the director, Botanic Garden, Buitenzorg. Received June 23, 1922.

55552. GARCINIA MANGOSTANA L. Clusiaceæ. **Mangosteen.**

55553. RHEEDIA EDULIS (Seem.) Planch. and Triana. Clusiaceæ.

"This is occasionally cultivated in Brazil under the name of *limão do matto* (wild lemon); it is a small, handsome tree with oblong glossy green leaves and elliptic yellow fruits 2 inches long. The white pulp is highly acid." (*Wilson Popenoe.*)

55554 and 55555.

From Barberton, Transvaal. Seeds presented by George Thorncroft. Received June 26, 1922.

55554. ANNONA SENEGALENSIS Pers. Annonaceæ.

A shrub or small tree, sometimes 20 feet in height, native to both eastern and western tropical Africa. The oval, blue-green leathery leaves are up to 5 inches in length, and the orange-yellow fruits, over an inch in diameter, contain an aromatic dark-red pulp which suggests that of the cherimoya of tropical America. (Adapted from *Schweinfurth, The Heart of Africa, p. 222,* and from *Oliver, Flora of Tropical Africa, vol. 1, p. 16.*)

For previous introduction, see S. P. I. No. 49843.

55555. BOLUSANTHUS SPECIOSUS (Bolus) Harms. Fabaceæ.
(*Lonchocarpus speciosus* Bolus.)

A small, ornamental, leguminous tree from southeastern and southern Africa, with compound deciduous leaves and long racemes of violet flowers which have given the name "Rhodesian wistaria" to the tree in some districts. The hard, white, durable timber is used only for wheel spokes. The tree is subtropical in its requirements, grows best in good deep soil, and is propagated only by seeds. (Adapted from *The Garden, vol. 78, p. 64.*)

For previous introduction, see S. P. I. No. 21808.

55556. TRITICUM DURUM Desf. Poaceæ. **Durum wheat.**

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received June 23, 1922.

"(June 3, 1922.) Red wheat from Tlemcen, Algeria." (*Trabut.*)

55557 and 55558. SOLANUM TUBEROSUM L. Solanaceæ. **Potato.**

From Ibarra, Ecuador. Presented by Sr. Jose Felix Tamayo. Received June 27, 1922. Quoted notes by Wilson Popenoe.

Seeds of the following potatoes, obtained for the use of plant breeders. Tubers of these varieties have been previously introduced; see S. P. I. Nos. 53190 and 53193.

55557. "*Cueruda blanca* (white cueruda) potato, 1921 crop, from the hacienda La Rinconada, in the Province of Carchi, where it is cultivated at altitudes between 11,000 and 12,000 feet.

"This is the most important commercial potato of Carchi Province. At Ibarra, where it is one of the favorite varieties on the market, it is known as *pastuza*. It yields heavily, and the whitish brown, somewhat flattened, oval tubers are of good size and quality. The eyes are very shallow and not numerous."

For previous introduction, see S. P. I. No. 53193.

55558. "*Cueruda morada* (purple cueruda) potato, 1921 crop, from the hacienda La Rinconada, Province of Carchi, where it is cultivated at altitudes between 11,000 and 12,000 feet.

"Commercially one of the best and most important varieties in northern Ecuador, though it is not quite so extensively grown as *cueruda blanca*. The tubers are oval, flattened, purple in color, with whitish areas around the shallow eyes; they possess excellent keeping qualities."

For previous introduction, see S. P. I. No. 53190.

55559 to 55562. DIOSCOREA ALATA L. Dioscoreaceæ. **Greater yam.**

From Montserrat, British West Indies. Tubers presented by W. Robson, curator, Agricultural Experiment Station. Received June 21, 1922. Quoted notes by R. A. Young.

55559. "*West White*. This is a white-fleshed yam, firm but mealy when cooked, and of good flavor. The vine is green, with narrow reddish wings at the four angles. Leaves long-ovate, cordate, acuminate; sinus fairly wide, but deep."

55560. "*West Red*. The inner skin of this yam is deep purple, and the flesh is purplish, mottled with deeper purple; it is mealy when cooked, but rather lacking in flavor. The wings on the vine are prominent and maroon colored. Leaves opposite, broadly ovate, cordate, acuminate; veins maroon; sinus deep and narrow; petiole maroon at base and apex."

55561. "*Barbados Red*. The inner skin is purple, and the flesh is light purple with scattered fibers of deeper purple. The flesh is rather firm, but mealy when cooked and of very good flavor. The vine has prominent maroon wings at the angles. Leaves opposite, ovate-cordate, acuminate; veins maroon; sinus deep and narrow, petiole maroon at base and apex."

For an illustration of this yam, see Plate VI.

55562. "*Bottle-Necked Lisbon*. This is a white-fleshed yam, which, when cooked, is mealy and of good flavor. The vine is green, with very narrow reddish wings. Leaves on young plants alternate, sagittate, basal lobes pointed; sinus very broad."

55563. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

Seedling selected at the Plant Introduction Garden, Chico, Calif., from seed obtained through John R. Putnam, American consul at Valencia, Spain, under S. P. I. No. 43570.

"Fruit large, yellow, with red blush. Flesh golden yellow throughout, of excellent flavor; pit small, not deeply grooved. Weight about 9 ounces.

Ripens at the Chico Plant Introduction Garden about August 20. This variety is of exceptional value as a commercial canning peach. Remains firm when cooked, maintains its delicate flavor, and does not require a very heavy sirup." (*J. E. Morrow.*)

55564. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

Seedlings selected at the Plant Introduction Garden, Chico, Calif., from seed obtained through John R. Putnam, American consul at Valencia, Spain, under S. P. I. No. 43571.

"Fruits a fine golden yellow with red blush; basin deep, suture distinct; pit very small and yellow, not coloring the flesh. Flesh firm and of fine flavor. Should prove excellent for canning and a good shipper. Average weight of fruits about 5 ounces. Ripens at the Chico Plant Introduction Garden about August 20." (*J. E. Morrow.*)

55565. MILLETTIA MEGASPERMA (F. Muell.) Benth. Fabaceæ.

From Abergeldie, New South Wales. Seeds presented by Sir Hugh Dixson, Summer Hill. Received June 23, 1922.

"This plant is quite unlike Chinese or Japanese varieties of wistaria. It has dark-green foliage and is a rank grower when established; mine is growing over a park railing 90 feet long, 4 feet wide, and 5 feet high and has to be kept within bounds on width and height. It is not particular as to soil, but I would not advise a heavy clay. The plant stands 8 to 10 degrees of frost without injury. The flowers are darker purple than those of the Chinese variety, sweet scented, and are borne in dense panicles. It is a very shy seeder, with seldom more than one seed in a pod but it strikes root freely when layered and also from cuttings. The root of a layer afterwards potted had the largest number of nodules I have ever seen on any leguminous plant. It is an exceedingly rare plant simply because its good qualities are not known." (*Dixson.*)

For previous introduction, see S. P. I. No. 50518.

55566. ILEX PARAGUARIENSIS St. Hil. Aquifoliaceæ. **Yerba maté.**

From Asuncion, Paraguay. Seeds presented by C. Fiebrig, director, Botanical Garden. Received May 27, 1922.

A small evergreen tree, native to Paraguay and Brazil, whose leaves are roasted and ground to make the Paraguay tea or *maté* of commerce. This plant may prove suitable for Florida and California.

For previous introduction, see S. P. I. No. 55489.

55567 and 55568. DIOSCOREA spp. Dioscoreaceæ. **Yam.**

From Ogbomosho, Nigeria, Africa. Tubers presented by Dr. George Green. Received June 23, 1922. Quoted notes by R. A. Young.

55567. DIOSCOREA CAYENENSIS Lam. **Yellow Guinea yam.**

(Nos. 11, 12, and 14.) "Three tubers, apparently all of the same variety, from a mixed lot. The flesh is cream colored instead of yellow, as in the variety of this species previously received from West Indian sources, and is less bitter; the quality is good. The vine is dark shiny green and thorny, with alternate leaves."

55568. DIOSCOREA ROTUNDATA Poir. **White Guinea yam.**

(No. 1.) "The specimen received is white fleshed, mealy, and of fair flavor when cooked. The vine is round stemmed, glaucous, and armed on the lower parts with short but strong recurved thorns. The leaves are opposite and on the lower parts of the main stem are modified into peculiar bracts, from the axils of which arise lateral branches. The variety appears to be different in quality from the one commonly grown in Porto Rico."

INDEX OF COMMON AND SCIENTIFIC NAMES.

Acacia albida, 55419.
catechu, 55420.
nubica, 55421.
spirocarpa, 55422.
verugera, 55423.
Acanthosicyos horrida, 55486.
Aeluropus repens, 55029.
Alfalfa, *Medicago sativa*, 55390, 55517–55519.
Allium odorum, 55442.
Allspice, *Pimenta officinalis*, 55102.
Alopecurus pratensis, 55375.
Amaranthus caudatus, 55424.
paniculatus, 55425.
viridis, 55405.
Amerimnon sissoo, 55411.
Amygdalus persica, 55487, 55549, 55563, 55564.
persica × *communis*, 55470.
Androsace sp., 55254.
spinulifera, 55253.
Anemone rupicola, 55255.
Annona senegalensis, 55554.
Anthyllis vulneraria, 55376.
Apple. See *Malus* spp.
Aralia cachemirica, 55000.
Arrhenatherum avenaceum. See *A. elatius*.
elatius, 55377.
Atalantia buxifolia. See *Severinia buxifolia*.
Avena nuda, 55479.
sativa, 55031–55039, 55378, 55466, 55467.
sterilis, 55520–55524.
Avocado, *Persea americana*, 55509.

Banana, *Musa arnoldiana*, 55101.
M. paradisiaca sapientum:
Chamaluco, 55246.
Ice Cream, 55247.
Iholena, 55248.
Kona Maiamaule, 55249.
Largo, 55250.
Miamauli, 55249.
Porto Rico, 55251.
Red Cuban, 55252.
Barberry. See *Berberis* spp.
Barley. See *Hordeum* spp.
Baryxylum africanum, 54988.
Basella rubra, 55065.
Bean, adsuki, *Phaseolus angularis*, 55430–55432.
Lima, *P. lunatus*, 54995.
mung, *P. aureus*, 55433, 55434.
soy, *Soja max*, 55069, 55070, 55437.
Yard-Long, *Vigna sesquipedalis*, 55438, 55439.
Beet, *Beta vulgaris*, 55379, 55380.
Berberis spp., 55074, 55075.
aggregata prattii, 55071.
dielsiana, 55072.
poireti, 55073.
Berry, salmon, *Rubus spectabilis*, 55371.
Beta vulgaris, 55379, 55380.
Betula medwediewi, 55076.
Birch, *Betula medwediewi*, 55076.
Blackberry. See *Rubus* spp.
Bluegrass, Kentucky, *Poa pratensis*, 55393.
Bolusanthus speciosus, 55555.
Bouea burmanica. See *B. oppositifolia*.
oppositifolia, 55046.
Brassica napus, 55381.
pekinensis, 54972.
Buckwheat, *Fagopyrum vulgare*, 55427.
Buddleia japonica, 55077.

Callicarpa giraldiana, 55078.
Campanula spp., 55256, 55257.
Capsicum annuum, 55472–55475.
Caragana sp., 55258.
Cardamine sp., 55259.
Carica papaya, 54992, 55468.
Carob, *Ceratonia siliqua*, 55464.
Habathi, 55448.
Matalafera, 54977.
Roches, 54978.
Sandalawi, 55449.
Schehabi, 55450.
Carrot, *Daucus carota*, 55383.
Casimiroa tetrameria, 55445.
Cassia sp., 55049.
nodosa, 54984.
siamea, 55025.
timoriensis, 55026.
Castanea sativa, 55079.
Cedar, East African, *Juniperus procera*, 55484.

Ceratonia siliqua, 54977, 54978, 55448–55450, 55464.
Chenopodium quinoa, 55051, 55471.
Cherry, *Prunus majestica*, 55417, 55476, 55498, 55500.
Chestnut, *Castanea sativa*, 55079.
Citrus spp., 55030, 55414–55416.
inodorus. See *Microcitrus inodora*.
Clematis spp., 55260, 55261.
Cloudberry, *Rubus chamaemorus*, 55370.
Clover, alsike. *Trifolium hybridum*, 55396.
red, *T. pratense*, 54980, 54999, 55002, 55368, 55397, 55502.
white, *T. repens*, 54979, 54993, 54994, 55398.
Codonopsis spp., 55262, 55263.
Coffea sp., 55100.
laurentii, 55042.
robusta. See *C. laurentii*.
Coffee. See *Coffea* spp.
Coix lacryma-jobi, 55413.
Colombian berry, *Rubus macrocarpus*, 55408, 55409.
Copihue, *Lapageria rosea*, 55372.
Coriander, *Coriandrum sativum*, 55426.
Coriandrum sativum, 55426.
Corn, *Zea mays*, 55045.
Bankutka, 55047.
Florentinka, 55048.
Cotoneaster spp., 55084–55086.
adpressa, 55080.
moupinensis, 55081.
multiflora, 55082.
salicifolia rugosa, 55083.
Cotton. See *Gossypium* spp.
Cowpea, *Vigna sinensis*, 55440, 55441.
Crab apple. See *Malus* spp.
Cremanthodium spp., 55264–55266.
Crepis sp., 55267.
Crotalaria juncea, 55369.
Cucumis melo, 55399–55404.
Cucurbita pepo, 55367, 55463.
Cynoglossum sp., 55268.

Dactylis glomerata, 55382.
Dalbergia sissoo. See *Amerimnon sissoo*.
Daucus carota, 55383.
Delphinium sp., 55269.
Deutzia spp., 55088, 55270.
schneideriana laxiflora, 55087.
Dioscorea alata, 54983, 55003, 55412, 55492, 55559–55562.
cayenensis, 55482, 55567.
esculenta, 54975.
rotundata, 55568.
Diospyros sp., 54989.
Draba sp., 55271.

Echinochloa crusgalli edulis, 55004–55023.
Eranthemum purpureum, 55050.
Erythrina micropteryx. See *E. poeppigiana*.
poeppigiana, 55040.
Euonymus sp., 55272.
Fagopyrum vulgare, 55427.
Fescue, *Festuca heterophylla*, 55066.
hard, *F. duriuscula*, 55384.
meadow, *F. elatior*, 55385.
Festuca duriuscula, 55384.
elatior, 55385.
heterophylla, 55066.
Foxtail, meadow, *Alopecurus pratensis*, 55375.
Fragaria spp., 54976, 55516.
vesca semperflorens, 54996.
Fritillaria sp., 55273.

Garcinia sp., 55455.
mangostana, 55496, 55552.
tinctoria, 55105, 55454.
xanthochymus. See *G. tinctoria*.
Gentiana spp., 55275–55279.
detonsa, 55274.
Girardinia palmata, 55001.
Glycine hispida. See *Soja max*.
Gorli, *Oncoba echinata*, 55465.
Gossypium spp., 55099, 55451–55453.
anomalum, 55410.
Grape, *Vitis davidii*, 55098.
Grass, *Aeluropus repens*, 55029.
kokoma, *Manisuris exaltata*, 55068.
meadow, rough-stalked, *Poa trivialis*, 55394.
orchard, *Dactylis glomerata*, 55382.
Phalaris bulbosa, 55067.
rye, Italian, *Lolium multiflorum*, 55387, 55528.
velvet, *Notholcus lanatus*, 55391.

Hedychium sp., 55280.
Hemerocallis sp., 55281.
Hibiscus spp., 55057–55064, 55167–55211.
cannabinus, 55481.
rosa-sinensis, 55444.
syriacus, 55166.
Holcus lanatus. See *Notholcus sorghum*, 55106–55165, 55428.
Honeysuckle. See *Lonicera* spp.
Hordeum distichon palmella, 55386.
vulgare pallidum, 55525–55527, 55551.

Ilex paraguariensis, 55489, 55493, 55566.
Incarvillea sp., 55282.
Iris spp., 55283–55292.

Jacaratia mexicana, 55469.
Job's tears, *Coix lacryma-jobi*, 55413.
Juglans spp., 55373, 55374.
Jujube, *Ziziphus jujuba*, 55056.
Indian, *Z. mauritiana*, 55485.
Juniperus procera, 55484.

Kassod tree, *Cassia siamea*, 55025.
Kidney vetch, *Anthyllis vulneraria*, 55376.
Kleinhovia hospita, 54985.

Lapageria rosea, 55372.
Larkspur, *Delphinium* sp., 55269.
Lens esculenta. See *Lentilla lens*.
Lentil, *Lentilla lens*, 55490, 55491.
Lentilla lens, 55490, 55491.
Ligustrum delavayanum, 55089.
Lilium spp., 55293–55295.
Lily. See *Lilium* spp.
water, *Nymphaea* sp., 54982.
Lime, Russell River, *Microcitrus inodora*, 55447.
Limonium brassicaefolium × *imbricatum*, 55043.
fruticans, 55044.
Lolium multiflorum, 55387, 55528.
Lonchocarpus speciosus. See *Bolusanthus speciosus*.
Lonicera spp., 55296, 55297.
Lotus corniculatus, 55388.
Lupine, *Lupinus* sp., 55052.
Lupinus sp., 55052.
Lychnis spp., 55298, 55299.
Lycopersicon esculentum, 55483, 55503.

Malabar nightshade, *Basella rubra*, 55065.
Malus spp., 55053, 55054.
sylvestris, 55212–55232.
Mangosteen, *Garcinia mangostana*, 55496, 55552.
Manisuris exaltata, 55068.
Matasano, *Casimiroa tetrameria*, 55445.
Meadow foxtail, *Alopecurus pratensis*, 55375.
Meconopsis spp., 55303, 55304.
aculeata, 55300.
primulina, 55301.
pseudointegrifolia, 55302.
Medic, black, *Medicago lupulina*, 55389.
Medicago lupulina, 55389.
sativa, 55390, 55488, 55517–55519.
Meibomia rensoni, 55446.
Melastoma repens, 55443.
Microcitrus inodora, 55447.
Millet, barnyard, *Echinochloa crus-galli edulis*, 55004–55023.
Millettia megasperma, 55565.
Musa arnoldiana, 55101.
paradisiaca sapientum, 55246–55252.
Muskmelon, *Cucumis melo:*
Chitta, 55,399.
Khurra, 55400.
mixed, 55404.
Safada, 55401, 55402.
Sarda, 55403.

Nageia nagi, 55477.
Nightshade, Malabar, *Basella rubra*, 55065.
Notholcus lanatus, 55391.
Nymphaea sp., 54982.

Oats. See *Avena* spp.
Oncoba echinata, 55465.
Onion, *Allium odorum*, 55442.
Oreocharis sp., 55305.
Ornithopus sativus, 55548.
Oryza sativa, 55429.

Palm, *Pinanga insignis*, 54986.
Papaya, *Carica papaya*, 54992, 55468.
Passiflora maliformis, 55028.
Peach, *Amygdalus persica*, 55563, 55564.
Goodman's Choice, 55549.
Pomona Improved, 55487.
Peach-almond hybrid, *Amygdalus persica* × *communis*, 55470.
Pear. See *Pyrus* spp.
Peltophorum africanum. See *Baryxylum africanum*.
Pepper, red, *Capsicum annuum*, 55472–55475.
Persea americana, 55509.
gratissima. See *P. americana*.
Persimmon, *Diospyros* sp., 54989.
Phalaris bulbosa, 55067.
Phaseolus angularis, 55430–55432.
aureus, 55433, 55434.
lunatus, 54995.
semierectus, 55418.
Phleum alpinum, 55435.
pratense, 55024, 55392, 55436, 55480.
Phlomis sp., 55306.
Picea sp., 55307.
Pimenta officinalis, 55102.
Pinanga insignis, 54986.
Plum, *Prunus* sp., 55090.
Poa pratensis, 55393.
trivialis, 55394.
Podocarpus nagi. See *Nageia nagi*.
Potato, *Solanum tuberosum:*
Adirondack, 55510.
Brownell's Beauty, 55511.
Carmen No. 1, 55512.
Chauchas (early), 55456–55462.
Cueruda blanca, 55557.
morada, 55558.
Edgecote Purple, 54981.
Manhattan, 55513.
Black, 55514.
Petronius, 55406.
Queen of the Valley, 55515.
Rubin, 55407.
Primrose. See *Primula* spp.

Primula spp., 55341–55351.
bella, 55308.
blattariformis, 55309.
brevifolia, 55310.
dryadifolia, 55311, 55312.
malvacea, 55313, 55314.
muscarioides, 55315–55319.
nivalis, 55320–55332.
poissoni, 55333, 55334.
secundiflora, 55335, 55336.
sikkimensis, 55337, 55338.
sinopurpurea, 55339.
vinciflora, 55340.
Privet, *Ligustrum delavayanum*, 55089.
Prunus sp., 55090.
majestica, 55417, 55476, 55498, 55500.
persica. See *Amygdalus persica*.
Psidium sp., 55103.
Pyracantha sp., 55091.
crenulata yunnanensis, 54991.
Pyrola sp., 55352.
Pyrus spp., 54997, 55055, 55497, 55550.
calleryana, 55027.
communis, 55233–55245.
malus. See *Malus sylvestris*.
pashia, 54998.

Quinoa, *Chenopodium quinoa*, 55051, 55471.

Rape, *Brassica napus*, 55381.
Raspberry. See *Rubus* spp.
Rheedia edulis, 55553.
Rheum sp., 55353.
Rhododendron spp., 55354–55359.
Ribes sp., 55093.
meyeri turkestanicum, 55092.
Rice, *Oryza sativa*, 55429.
Rosa omeiensis pteracantha, 55094, 55095.
Rose, *Rosa omeiensis pteracantha*, 55094, 55095.
Rottboellia exaltata. See *Manisuris exaltata*.
Rubus spp., 55505–55508.
chamaemorus, 55370.
ellipticus, 55499.
flavus. See *R. ellipticus*.
macrocarpus, 55408, 55409.
spectabilis, 55371.
Rumex tuberosus, 55494.
Rye, *Secale cereale*, 55395.

Sabinea carinalis, 55041.
Saccharum officinarum, 55501.
Salmon berry, *Rubus spectabilis*, 55371.
Salpichroa rhomboidea, 55478.
Saxifraga spp., 55360–55364.
Serradella, *Ornithopus sativus*, 55548.
Severinia buxifolia, 55495.
Sissu, *Amerimnon sissoo*, 55411.
Soja max, 55069, 55070, 55437.
Solanum tuberosum, 54981, 55406, 55407, 55456–55462, 55510–55515, 55557, 55558.
Sorbaria sp., 55097.
arborea subtomentosa, 55096.
Sorghum, *Holcus sorghum*, 55106–55165, 55428.
Sorghum vulgare. See *Holcus sorghum*.
Sorrel, *Rumex tuberosus*, 55494.
Spruce, *Picea* sp., 55307.
Squash, *Cucurbita pepo*, 55367, 55463.
Statice brassicaefolium × *imbricatum*. See *Limonium brassicaefolium* × *imbricatum*.
fruticans. See *Limonium fruticans*.
Strawberry. See *Fragaria* spp.
Sugar cane, *Saccharum officinarum*, 55501.
Sunn hemp, *Crotalaria juncea*, 55369.
Swertia sp., 55365.

Telfairia pedata, 55504.
Timothy, *Phleum pratense*, 55024, 55392, 55436, 55480.
Tomato, *Lycopersicon esculentum*, 55483, 55503.
Trifolium hybridum. 55396.
pratense, 54980, 54999, 55002, 55368, 55397, 55502.
repens, 54979, 54993, 54994, 55398.
Triticum durum, 55529–55546, 55556.

Uvaria sp., 54987.

Vangueria infausta, 54990.
Veratrum sp., 55366.
Vetch, *Vicia michauxii*, 55547.
kidney, *Anthyllis vulneraria*, 55376.
Vicia michauxii. 55547.
Vigna sesquipedalis, 55438, 55439.
sinensis, 55440, 55441.
Vitis davidii. 55098.
Voandzeia subterranea, 55104.

Wheat, durum, *Triticum durum*, 55529–55546, 55556.

Yam, *Dioscorea* spp.:
Barbados Red, 55561.
Bottle-Necked Lisbon, 55562.
greater, *D. alata*, 54983, 55003, 55492, 55559–55562.
lesser, *D. esculenta*, 54975.
Potato, 54975.
Purple Ceylon, 55412.
(unnamed), *D. cayenensis*, 55482.
West Red, 55560.
West White, 55559.
White Guinea, *D. rotundata*, 55568.
Yellow Guinea, *D. cayenensis*, 55567.
Yerba maté, *Ilex paraguariensis*, 55489, 55493, 55566.

Zea mays, 55045, 55047, 55048.
Ziziphus jujuba, 55056.
mauritiana, 55485.

Issued July, 1924.

U. S. DEPARTMENT OF AGRICULTURE.

BUREAU OF PLANT INDUSTRY.

INVENTORY

OF

SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM JULY 1 TO SEPTEMBER 30, 1922.

(No. 72; Nos. 55569 to 55813.)

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CONTENTS.

	Page.
Introductory statement	1
Inventory	5
Index of common and scientific names	39

ILLUSTRATIONS.

		Page.
PLATE I.	A young specimen of the mu-yu shu, or mu-oil tree. (*Aleurites montana* (Lour.) Wilson; S. P. I. Nos. 55647 to 55650)	14
II.	The carambola, a favorite fruit of southern China. (*Averrhoa carambola* L.; S. P. I. Nos. 55651 and 55652)	14
III.	An attractive relative of the magnolias. (*Michelia excelsa* Blume; S. P. I. No. 55690)	14
IV.	A new wild rose from southwestern China. (*Rosa* sp.; S. P. I. No. 55721)	24
V.	A new hybrid pear. (*Pyrus serotina* × *communis*; S. P. I. No. 55805)	24

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INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM JULY 1 TO SEPTEMBER 30, 1922 (NO. 72; NOS. 55569 TO 55813).

INTRODUCTORY STATEMENT.

The Chinese Province of Yunnan has in the past yielded many interesting ornamental plants to European collectors, but this inventory records the first time that an agricultural explorer from the Department of Agriculture has penetrated its mountain slopes and vast plains, where a climate similar to that of our Atlantic seaboard prevails.

While no such severe weather as that of the Dakotas ever visits this back country of China, it is a land of heavy frosts, and plants from its plains may be expected to do well in many parts of our Eastern States, while those from its wetter mountain slopes will doubtless find a congenial home in the Puget Sound region.

The plants which appear in this inventory represent a small fraction only of the great collections which the department's explorer, J. F. Rock, has gathered under conditions of living and travel which would daunt any but the real enthusiast. His travels have taken him over hundreds of miles of almost impassable mountain trails and roads through regions where Chinese bandits abound and have necessitated a constant association month after month with people who neither understand what he is doing nor care regarding his fate.

From the Likiang Snow Range, at an altitude of 11,000 feet, Mr. Rock sent six rare lilies, one of them *Lilium sutchuenense* (No. 55609), and five others as yet undetermined (Nos. 55610, 55730, and 55778 to 55780). From Likiang he forwarded seeds of a white-flowered ornamental bush (*Prinsepia utilis;* No. 55719), a fine climbing rose (No. 55721), and a wild species of cherry (No. 55720) that grows to 50 feet in height which he suggests may be used as a stock for the cultivated cherries. At Nguluke, in the Likiang Valley, 8,000 feet above sea level, Mr. Rock found a small, sour, red-fruited apricot (*Prunus armeniaca;* No. 55729) of deliciously fragrant aroma, which is used there for stewing and jam making, and in the foothills of Talifu he obtained seeds of the rare cherry (*P. majestica;* No. 55732) which grows into large trees and has a vigor suggesting its use as a stock or as an ornamental flowering tree. Seeds from large freestone peaches (*Amygdalus persica;* Nos. 55775 and 55776) borne by trees growing wild near Puerhfu and seeds of a large-fruited plum (*Prunus* sp.; No. 55783) from the same region are part of his shipments which have recently arrived.

H. R. Wright, of Auckland, New Zealand, to whom the department is indebted for many valuable collections of new fruit varieties, has sent his "Sunrise" (No. 55740), a very early variety of peach, and "Watts Early" (No. 55741), a peach worth testing in Florida because of the unusually short resting period which it requires. He also sent the Groverly Navel orange (*Citrus sinensis;* No. 55743), which is reported to be a large-sized variety with a habit for cropping which should make it worth a trial both in California and Florida.

G. Weidman Groff, of the Canton Christian College, has sent from South China a collection of trees, including the mu-oil tree (*Aleurites montana;* Nos. 55647 to 55650), some varieties of persimmon (*Diospyros kaki;* Nos. 55659 and 55660), an undetermined species of Diospyros (No. 55662), an interesting rare ornamental (*Millettia dielsiana;* No. 55663), two varieties of the carambola (*Averrhoa carambola;* Nos. 55651 and 55652), a fruit tree recently attracting attention in southern Florida, and a large promising ornamental tree from the Five Finger Mountains (*Nageia cupressina;* No. 55664).

F. A. McClure, also of the Canton Christian College, secured for the department during his recent exploration of the island of Hainan, off the coast of South China, several interesting plants (Nos. 55626 to 55632) and from Lokong in Kwantung seeds of 13 named varieties of *Prunus mume* (Nos. 55633 to 55645), from which some valuable strains of this lovely flowering tree may originate in this country.

Prof. C. S. Sargent, of the Arnold Arboretum, has favored the department with material from a new hardy Chinese shrub (*Prinsepia sinensis;* No. 55711) whose yellow flowers appear very early in the spring and entitle it to a place in every North Atlantic garden, even should its fruits not meet with an enthusiastic reception in America. The genus with its several species is worthy of the attention of American horticulturists.

The success which attended the introduction through this office many years ago of the hairy Peruvian alfalfa is a matter of history. Crops of it worth several million dollars are grown every year in southern California. Growers will watch with interest the introduction now of the so-called San Pedrana variety (*Medicago sativa;* No. 55724) from Peru which, according to Mr. Dunn, is cut every 45 days.

Although it is yet too soon to predict the ultimate fate of the lowland Guatemalan anona in southern Florida, its growth there has been so satisfactory that a large quantity of seed of this species (*Annona diversifolia;* No. 55709) has been imported from Tapachula.

The so-called subterranean clover of Australia (*Trifolium subterraneum;* No. 55707), which was introduced several years ago, has shown so much promise in the Southern States that a second importation of seeds has been necessary.

A beautiful Australian shade tree, *Vitex littoralis*, grew 30 feet tall at Del Monte, Calif., years ago, but was cut down by a temperature of 17° F. A New Zealand species of this same genus (*V. lucens;* No. 55620) may prove hardier than its relative.

It seems strange that a magnificent tree in the mountain gorges of the great African continent should be in danger of becoming extinct, but such is the case. In fact, so fast are some of the wonderful forest trees of the globe disappearing that our grandchildren, even when they circle the world through the air, will not have the supreme pleasure which the Africanders had, as, traveling at a snail's pace with ox teams across the veldt, they stood in the presence of the leafy giants of the Milanji cypress, whose crowns rose 140 feet above the earth. From Southern Rhodesia W. L. Thompson, of the American Board Mission, has sent the department seed of this wonderful tree (*Callitris whytei;* No. 55602) which survives now only in the gorges of that region not visited by forest fires, and it is hoped that these may grow and establish themselves in other regions.

G. H. Cave, the curator of the Lloyd Botanic Gardens at Darjiling, to whom in the past the department has been indebted for many courtesies, has sent a remarkable collection of seeds of Himalayan ornamental and economic trees and shrubs (Nos. 55669 to 55706). It includes one of the hill bamboos (*Cephalostachyum capitatum;* No. 55676); a yellow-flowered clematis (*C. grewiaeflora;* No. 55677); a species of that small genus to which belongs the Japanese loquat (*Eriobotrya hookeriana;* No. 55679) with egg-shaped yellow fruits three-fourths of an inch long, possibly useful for breeders or as a stock; *Ilex insignis* (No. 55682), which has proved hardy in Ireland; a bright-flowered Indigofera (No. 55683); the famous pink-flowered Himalayan magnolia (*Magnolia campbellii;* No. 55688); three species of Michelia (Nos. 55689 to 55691), trees with magnolialike flowers and foliage, one of them the principal timber tree of the Darjiling Hills; the Himalayan spruce (*Picea smithiana;* No. 55694); and a Himalayan cherry (*Prunus napaulensis;* No. 55696) from an altitude of 10,000 feet.

Guarana is a paste that is much used by the natives of the Amazon Valley to make a beverage which contains caffein and, like cacao and coffee, is a stimulant. It is prepared from the grapelike fruits of a climbing shrub (*Paullinia cupana;* No. 55738), the culture of which in Brazil has been a lucrative industry. Seeds of this shrub have been presented by Doctor da Costa, of Rio de Janeiro.

The so-called kiffy of Sierra Leone is the roasted seed of a cucumberlike plant (*Cucumeropsis mannii;* No. 55792) which is used as a condiment by the natives in the preparation of their remarkable dish known as dumboy.

Doctor Shirai, of Komaba, Japan, has presented plants of two distinct varieties of *Elaeagnus multiflora* (Nos. 55771 and 55772), the "Ogumi" and the "Togumi." As this species grows well on the Atlantic seaboard, these two large-fruited varieties will be wanted by those who have the ordinary small-fruited form.

Doctor Shantz has imported, in order to test again, the narras (*Acanthosicyos horrida;* No. 55763), a melonlike fruit which the Hottentots grow on the sand dunes of the Kalahari Desert and upon which they live for months.

The wild black cherry (*Prunus serotina*) has been determined to be botanically identical with the capulin of Central America and northwestern South America; but, whereas Americans have done nothing to improve this native cherry, our southern neighbors have

by selection evolved from their wild capulin or native cherry a large delicious fruit which is borne in clusters and is sold on their markets (Nos. 55764 and 55765).

Norman M. Ross, who has for many years tested the dwarf pea tree in his Forestry Station at Indian Head, Canada, recommends for wide distribution throughout the Northwest this handsome shrub (*Caragana pygmaea;* No. 55769) of Siberia and furnishes seeds for that purpose.

The "Toeban" (*Arachis hypogaea;* No. 55810), an early-maturing bunch strain of peanut which is resistant to the bacterial disease prevalent in Java caused by *Bacterium solanacearum*, will interest peanut growers in America; and Mr. Morrow's new peach (No. 55813) that originated as a sucker at the Chico garden from a stock which was used for the Tangutian almond (*Amygdalus tangutica*) proves to be a week later than the Elberta and of finer texture than that standard variety.

The botanical determinations of seeds introduced have been made and the nomenclature revised by H. C. Skeels; and the descriptive and botanical notes have been arranged by Paul Russell, who has had general supervision of this inventory.

David Fairchild,
Agricultural Explorer in Charge.

Office of Foreign Seed and Plant Introduction,
Washington, D. C., September 17, 1923.

INVENTORY.[1]

55569 to 55572.

From Cuenca, Ecuador. Seeds presented by Dr. Federico Malo. Received July 24, 1922. Quoted notes by Doctor Malo.

55569 to 55571. MEDICAGO SATIVA L. Fabaceæ. **Alfalfa.**

"These are from the principal localities where alfalfa is produced; that which comes from the town of Guanando is considered especially good."

55569. "From Dr. José A. Avilez, town of Guano."

55570. "Purchased from Paula Iza, who brought it from Cuchibamba, near Ambato."

55571. "Obtained from Antonio Moyano and said to have been grown at Guanando."

55572. TRIFOLIUM REPENS L. Fabaceæ. **White clover.**

"This white-flowered clover from the vicinity of Burgay, near Biblian, is produced spontaneously; the stock are very fond of it."

55573 and 55574. PHASEOLUS AUREUS Roxb. Fabaceæ. Mung bean.

From Manila, Philippine Islands. Seeds presented by George S. Logan, through the Bureau of Foreign and Domestic Commerce, United States Department of Commerce. Received July 6, 1922.

These two varieties of the mung bean were originated at the Lamao Experiment Station. The mung bean is cultivated throughout southern Asia and the adjacent islands, where its seeds constitute a very important human food and its straw a valuable fodder.

55573. *Yellow mongo.* **55574.** *Green mongo.*

55575 to 55578. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. Tomato.

From Bogota, Colombia. Seeds presented by Q. U. Thompson. Received July 25, 1922.

These tomatoes are introduced from various places in Colombia in the hope of finding a strain which will prove immune to leaf-spot, a serious pest in this country.

55575. From Bogota. **55577.** From Fusagasuga.

55576. From Girardot. **55578.** From San Antonio de Tena.

[1] It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in these inventories are those which the material bore when received by the Office of Foreign Seed and Plant Introduction and, further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in these inventories will be subject to change with a view to bringing the forms of the names into harmony with recognized American codes of nomenclature.

55579. CYRTOSTACHYS LAKKA Beccari. Phœnicaceæ. **Palm.**

From Singapore, Straits Settlements. Seeds presented by I. Henry Burkill, superintendent, Botanic Gardens. Received July 24, 1922.

A stately and elegant palm, native to the East Indies, with a slender spineless stem crowned by a cluster of boldly arched pinnate leaves 3 to 4 feet in length. It is distinguished by its red leaf sheaths. The fruits are elongate egg-shaped and about half an inch long. (Adapted from *Beccari, Annales du Jardin Botanique de Buitenzorg, vol. 2, p. 141,* and *Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 947.*)

J. F. Rock recommends this as a handsome ornamental plant, probably suitable for cultivation in southern Florida. It is doubtful whether it will withstand heavy frosts.

For previous introductions, see S. P. I. Nos. 49530 and 51870.

55580 to 55584.

From Canton, China. Plants presented by the Canton Christian College, through F. A. McClure. Received July 29, 1922. Quoted notes by Mr. McClure.

55580 and 55581. FORTUNELLA spp. Rutaceæ. **Kumquat.**

Introduced for department specialists engaged in citrus-breeding experiments.

55580. FORTUNELLA sp.

"(C. C. C. introduction No. 793.) Obtained from near a Chinese village (Sants'uen) in the island of Hainan, where it is found in a semicultivated state. The natives gather the fruits, which ripen in November, and eat them fresh or candy them. Some few of the fruits find their way to the markets, although they are not generally much in favor with the Chinese, owing to their acid taste. They have almost no seed, and in this respect are excellent for candying. The fruits are small, seldom attaining a size of more than an inch in diameter; the segments adhere to each other very firmly. The plants are never grafted, but are allowed to spring up from scattered seed."

55581. FORTUNELLA sp.

"(C. C. C. introduction No. 794.) Obtained from the wild in the Five Finger Mountains of the island of Hainan. I found the plant in flower in May. A few fruits at that time were brought to me by the natives. The flavor is rather sweeter than one would expect to find in wild fruits; these are not of commercial importance, as they are known only by the primitive tribes that inhabit the interior of the island. They gather the wild fruits and evidently consider them quite a delicacy, although they never take the trouble to plant the seeds near their houses. There is a slight prominence on the fruit at the stem end, which is characteristic."

55582 and 55583. PHYLLOSTACHYS spp. Poaceæ. **Bamboo.**

"These are grown for timber and also for food, the young shoots being eaten."

55582. PHYLLOSTACHYS sp.

"(C. C. C. observation No. 901.2.) *Tai t'au tim chuk.*"

55583. PHYLLOSTACHYS sp.

"(C. C. C. observation No. 901.2.) *Ma chuk.*"

55584. ZIZANIA sp. Poaceæ. **Wild rice.**

"(C. C. C. introduction No. 860.) *Kau sun.* This is grown by the Chinese in wet culture. The stock at the crown becomes infected with a smut, and the enlarged growth at that point is used as food. This product is very similar in appearance, texture, and flavor to the bamboo shoots and is prepared in the same manner."

55585. Oxalis tuberosa Molina. Oxalidaceæ. **Oca.**

From Tucuman, Argentina. Tubers presented by E. F. Schultz, horticulturist, Agricultural Experiment Station. Received July 31, 1922.

"A plant related to our common sheep sorrel, widely cultivated in Peru and Bolivia for the sake of its fleshy rootstocks, which are an important article of food. In some districts ocas are second only to potatoes, while in others ullucus (*Ullucus tuberosus* Caldas) are more important, or at least are sold more generally in the native markets. Ocas are eaten raw, as well as cooked, and are also frozen and dried. Ocas prepared in this last-mentioned way are called caya, a term corresponding to chuño, the name of the dried potatoes. Raw ocas, when first dug, have a distinctly acid taste, like sheep sorrel, but this is lost after the tubers have been exposed to the sun.

"The plant attains a height of 1 foot or more and has the general appearance of a large plant of sheep sorrel. The flowers are yellow, and the leaflets are folded at night or in wet weather, the same as the sheep sorrel.

"The varieties are numerous, though much fewer than in the case of the potato. Some are preferred for eating raw and others for the making of caya. The texture of the tubers is very tender and juicy. In form some are nearly cylindrical, while others are slender at the base and strongly thickened at the end. The colors vary from white or light pink through darker pinks or yellows to deep purplish red. The range of colors is much the same as in the ulluco, but no deep-yellow varieties were seen, nor any with spots, except that some have bands of deeper color across the eyes.

"In addition to the pleasing coloration, the surface of the tubers is smooth and clear, so that the general appearance is very attractive. The texture of the flesh is also very tender and crisp. If the taste should prove acceptable, ocas might become very popular for salads and pickles, if not for other purposes. The nature and habits of the plant indicate that it may be adapted to acid soils, which would be a distinct advantage in some parts of the United States." (*O. F. Cook.*)

For previous introductions, see S. P. I. Nos. 41168 to 41176.

55586. Medicago sativa L. Fabaceæ. **Alfalfa.**

From Buenos Aires, Argentina. Seeds presented by D. S. Bullock, agricultural commissioner, Bureau of Agricultural Economics, United States Department of Agriculture. Received July 28, 1922.

Introduced for comparison and cultural experiments.

55587. Prunus serrulata Lindl. Amygdalaceæ. **Japanese flowering cherry.**

From Yokohama, Japan. Seeds purchased from the Yokohama Nursery Co. Received July 24, 1922.

Forma *lannesiana*. A variety of Japanese cherry known as *Mazakura* (synonym, *Dai Sakura*), used in Japan as a stock. Prof. Yugo Hoshino, of the Tohoku Imperial University at Sapporo, is quoted as follows in Hedrick's "Cherries of New York," p. 75: "In the northern part of Japan proper (main island) it is a common practice to graft European cherries on a special kind of Japanese cherry. This cherry has a peculiar character which fits it for propagation, namely, it roots very easily either from cuttings or by mound layering. It is grown by nurserymen only and is called *Dai Sakura*. It has a somewhat dwarfing influence on scions and hastens their fruiting age."

For previous introduction, see S. P. I. No. 38206.

55588. Microcitrus australasica (F. Muell.) Swingle. Rutaceæ. (*Citrus australasica* F. Muell.) **Finger lime.**

From Dundas, New South Wales. Seeds presented by Herbert J. Rumsey. Received July 13, 1922.

"The finger lime is one of the most curious and interesting of the citrus fruits. The young plants have more or less horizontally arranged branchlets, with very short internodes and small oval young leaves, these much shorter than the stiff, erect spines. The flowers are small, and the fruits are long

and slender, 2½ to 4 inches long, with a loose pulp filled with a sour, rather strongly pungent juice. The shrub is native to the mountain scrubs of the coastal region of northern New South Wales and Queensland." (*W. T. Swingle.*)

"This relative of the citrus fruits has been used in creating several hybrids, chiefly with the Calomondin (*Citrus mitis*), a Philippine species (see S. P. I. Nos. 27724 to 27736); also with the Mexican lime and the common lemon. The fruits produced, as a rule, have resembled the finger lime more closely than the other parents, not being sufficiently juicy as compared with lemons or limes for economic use, and possessing a peculiar aromatic odor. Their use as citrus stocks and as hedge plants, particularly in the semiarid regions of the Southwest, seems worth a trial, and experiments along this line are under way." (*T. Ralph Robinson.*)

55589. FRAGARIA sp. Rosaceæ. **Strawberry.**

From Paris, France. Seeds presented by Vilmorin-Andrieux & Co. Received July 26, 1922.

Introduced for experiments in strawberry breeding.

"This form is close to *Fragaria nilgerrensis;* it has the same foliage and the same small white fruits with darker seeds, but it is more vigorous, and the fruits might be considered as edible, whereas in the type their taste is unpleasant." (*Vilmorin-Andrieux & Co.*)

55590 and 55591. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

From Buenos Aires, Argentina. Presented by D. S. Bullock, agricultural commissioner, Bureau of Agricultural Economics, United States Department of Agriculture. Received July 26, 1922. Quoted notes by E. F. Schultz, Tucuman Experiment Station.

These tomatoes are introduced for the use of specialists in breeding blight-resistant varieties.

"The variety most extensively planted here in Tucuman, especially in the Lules region, is known under the name of *Parana*. It is generally regarded as the most blight-resistant variety, but my own experience has led me to the conclusion that it is not completely resistant, although there are always a number of plants which do not suffer at all when the rest of the plants have died from the disease."

55590. "Seeds of *Parana* from Lules, Tucuman."

55591. "Seeds from blight-resistant plants of *Parana*, grown at the Tucuman Experiment Station in 1921."

55592 and 55593. MUSA spp. Musaceæ. **Banana.**

From Kisantu, Belgian Congo. Seeds presented by Père J. Gillet, S. J., Jardin d'Essais de Kisantu. Received July 27, 1922. Quoted notes by Père Gillet.

"These bananas are handsomer and probably more hardy than *Musa ensete;* they grow in the mountains of Ruanda at altitudes of 6,500 feet or more."

55592. MUSA sp.

"An undetermined variety with white nerves."

55593. MUSA sp.

"An undetermined variety with red nerves."

55594 to 55597. DIOSCOREA ALATA L. Dioscoreaceæ. **Greater yam.**

From Holguin, Cuba. Tubers presented by Thomas R. Towns. Received July 24, 1922. Quoted notes by R. A. Young.

55594. *Pelua.* "A white-fleshed yam, comparatively small; tubers said to weigh 3 pounds each. Vine four angled, with narrow pale-maroon wings. Leaves broadly ovate, cordate, plain green."

55594 to 55597—Continued.

55595. *Frances.* "A white-fleshed yam; said to weigh up to 25 pounds or more in each hill. Vine four angled, with pale-maroon wings. Leaves alternate, broadly ovate, cordate, acuminate; sinus fairly deep and narrow."

55596. *Kohl-E-Patta.* "A white-fleshed yam whose tubers are said to weigh as much as 25 pounds to the hill."

55597. *Morado.* "This yam has purple inner skin and white flesh; it is said to weigh up to 25 pounds or more in each hill. The vine is four angled, with narrow maroon wings. Leaves broadly ovate, cordate, acuminate; sinus deep and narrow; petioles maroon at base and apex."

55598. CLAUCENA LANSIUM (Lour.) Skeels. Rutaceæ. **Wampi.**
(*C. wampi* Oliver.)

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, in charge, Department of Botany and Forestry, Experiment Station of the Hawaiian Sugar-Planters' Association. Received August 3, 1922.

The wampi is a very ornamental small tree, 18 to 20 feet in height; in the spring it bears small dense panicles of whitish sweet-scented flowers, and in midsummer appear the grapelike clusters of edible berries. The individual fruits are about the size of a large marble, with a rough, pale straw-yellow, orangelike rind covered with glands filled with green balsamic oil; the rather large seeds, one to three in number, are inclosed in colorless juicy pulp which has an agreeable aromatic acid flavor. The wampi is a native of South China, where the berries are highly esteemed, both as a dessert fruit and for preserves. Propagation is by seeds and layering. (Adapted from *Report of Hawaii Agricultural Experiment Station, 1914, p. 33.*)

For previous introduction and illustration, see S. P. I. No. 45328.

55599 to 55601.

From Richmond, Victoria. Seeds presented by F. H. Baker. Received July 29, 1922.

55599. CASSIA LAEVIGATA Willd. Cæsalpiniaceæ.

An erect shrubby ornamental cassia several feet in height, with axillary and terminal racemes of large yellow flowers and cylindrical leathery pods, 2 to 3 inches long, inflated when ripe. Native to Queensland and New South Wales. (Adapted from *Bentham, Flora Australiensis, vol. 2, p. 282.*)

For previous introduction, see S. P. I. No. 53851.

55600. INDIGOFERA AUSTRALIS Willd. Fabaceæ.

An attractive shrub 2 to 4 feet high, with erect branches, finely divided compound leaves, and dense racemes of very showy violet-red flowers. (Adapted from *Bentham, Flora Australiensis, vol. 2, p. 199.*)

For previous introduction, see S. P. I. No. 47152.

55601. KENNEDIA MONOPHYLLA Vent. Fabaceæ.
(*Hardenbergia monophylla* Benth.)

An ornamental Australian vine, with alternate smooth leaves and a profusion of blue flowers borne in stalked racemes. The long carrot-shaped somewhat woody root is called "sarsaparilla" by the natives and is used in infusion as a substitute for that root. (Adapted from *Lindley, Treasury of Botany, vol. 1, p. 569.*)

For previous introduction, see S. P. I. No. 51757.

55602. CALLITRIS WHYTEI (Rendle) Engl. Pinaceæ.
(*Widdringtonia whytei* Rendle.)

From Mount Silinda, Southern Rhodesia. Presented by W. L. Thompson, American Board Mission. Received July 24, 1922.

"Native cedar of this region. These seeds are from trees in our own grounds." (*Thompson.*)

The *Milanji cypress* was originally found at an altitude of 10,000 feet on Mount Milanji, in Nyasaland, by Alexander Whyte. It is a magnificent tree reaching a height of 140 feet, sometimes with a clear straight trunk for 90 feet and a diameter of 5½ feet at 6 feet from the base. The pale reddish timber is of excellent quality and easily worked. The bark on old trees is of great thickness. These fine trees are rapidly disappearing before the forest fires, only those in damp gorges surviving. (Adapted from *Transactions of the Linnean Society, 2d ser., vol. 4, p. 60,* and *Gardener's Chronicle, 3d ser., vol. 37, p. 18.*)

For previous introduction, see S. P. I. No. 52807.

55603. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Roskilde, Denmark. Presented by Danske Landboforeningers Frøforsyning. Received August 2, 1922.

Timothy seed produced locally for several seed generations; introduced for breeding experiments.

55604. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Prague, Czechoslovakia. Presented by Basil Benzin. Received July 31, 1922.

Locally grown seed intrdouced for timothy breeding experiments.

55605 and 55606. RUMEX spp. Polygonaceæ.

From Okitsu, Japan. Seeds presented by T. Onda, director, Government Horticultural Experiment Station. Received August 2, 1922.

These sorrels, which are used as salad vegetables in Japan, are introduced for trial as food for diabetics.

55605. RUMEX ACETOSA L. **Sorrel.**

Suiba.

55606. RUMEX CRISPUS L. **Curly dock.**

Variety *japonicus. Gishi-gishi.*

55607. BOWENIA SPECTABILIS Hook. Cycadaceæ.

From Brisbane, Queensland. Seeds presented by C. T. White, Government botanist. Received August 1, 1922.

An Australian cycad with a short, thick, cylindrical stem which bears at the summit one or two large, very graceful, compound fernlike leaves. It makes a charming little ornamental and should thrive well in lath houses in Florida when given proper shade, a good supply of moisture, and soil rich in humus. (Adapted from *Curtis's Botanical Magazine, pl. 5398,* and *Bailey, Standard Cyclopedia of Horticulture, vol. 1, p. 537.*)

55608. PRUNUS TOMENTOSA ENDOTRICHA Koehne. Amygdalaceæ. **Bush cherry.**

From Jamaica Plain, Mass. Cuttings presented by Dr. C. S. Sargent, Arnold Arboretum. Received August 9, 1922.

A large spreading shrub or small tree with densely hairy branches, dark-green, toothed, sharp-pointed leaves about 3 inches long, solitary white flowers three-fourths of an inch across, and dark-red fruits about half an inch in diameter. The plant is found native in western Hupeh and northern Shensi, China. (Adapted from *Sargent, Plantae Wilsonianae, vol. 1, p. 225.*)

55609 and 55610. LILIUM spp. Liliaceæ. **Lily.**

From Likiang, Yunnan, China. Bulbs collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received August 9, 1922. Quoted notes by Mr. Rock.

55609 to 55610—Continued.

55609. LILIUM SUTCHUENENSE Franch. **Lily.**

"(No. 4402. Likiang, Yunnan. June 13, 1922.) A lily 3 to 4 feet in height, growing among limestone rocks and along brooks in scrub vegetation at an altitude of 10,000 to 11,000 feet on the Likiang Snow Range, near the Moso village of Nguluke. The flowers are borne at the apex of the stem in twos and threes and are very variable in color, ranging from orange-yellow to red and reddish brown, the inner part of the corolla being spotted purple."

55610. LILIUM sp. **Lily.**

"(No. 4532. Likiang, Yunnan. June 17, 1922.) A plant 2 to 2½ feet high, growing among limestone crags in pine and fir forests at altitudes of 12,000 feet and higher. These bulbs were collected on the slopes of the Likiang Snow Range. The flowers, which are smaller than those of *Lilium sutchuenense*, are green and marked on the outside and inside with deep purplish spots. The lobes are much reflexed, making the perianth pitcher shaped. This species is not common, while *L. sutchuenense* is found more frequently."

55611 to 55615. PHOENIX spp. Phœnicaceæ. **Palm.**

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received July 25, 1922.

"These Phoenix hybrids are all small plants, developing shoots from the base, and are highly ornamental. They have proved quite hardy here, withstanding the severe frost of 1920 (20° or 21° F.), the lowest temperature since 1829." (*Proschowsky.*)

55611. PHOENIX sp.
(No. 1.)

55612. PHOENIX sp.
(No. 2.)

55613. PHOENIX sp.
(No. 3.)

55614. PHOENIX sp.
(No. 4.)

55615. PHOENIX sp.
(No. 5.)

55616. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Prague, Czechoslovakia. Presented by Basil Benzin. Received August 12, 1922.

Locally grown timothy seed introduced for the use of forage-crop specialists.

55617 and 55618.

From Aitutaki, Cook Islands. Tubers presented by W. T. Hewett. Received August 11, 1922. Quoted notes by R. A. Young.

55617. COLOCASIA ESCULENTA (L.) Schott. Araceæ. **Taro.**

"*Taro-repo.* A taro with slightly pink buds."

55618. XANTHOSOMA sp. Araceæ. **Yautia.**

"A white-fleshed yautia of good quality, received under the name 'taro-tarua.' The buds are very slightly tinged with pink."

55619 and 55620.

From Auckland, New Zealand. Seeds presented by Stanley G. Chambers, secretary, Auckland Acclimatisation Society. Received August 11, 1922.

55619. RHOPALOSTYLIS SAPIDA (Soland.) Wendl. and Drude. Phœnicaceæ. **Nikau.**

An elegant palm from New Zealand; it is of peculiar interest because of its distribution, as it occurs farther south than any species of palm in either Australia or South America, being found at 38° 22′ south lati-

55619 to 55620—Continued.

tude. The pinnate leaves, 4 to 6 feet in length, are borne on a trunk 6 to 12 feet high, and the very numerous flowers, occurring on a densely flowered, much-branched spadix, are pale pink. The young inflorescence is eaten by the natives of New Zealand. (Adapted from *Curtis's Botanical Magazine, pl. 5139.*)

For previous introduction, see S. P. I. No. 54298.

55620. VITEX LUCENS Kirk. Verbenaceæ. **Puriri.**

A fine tree, from 50 to 60 feet in height, native to New Zealand, but restricted to the northern part of North Island. It is often called the New Zealand oak on account of the strength and durability of its wood, which is not injured by damp or exposure and is therefore extremely valuable for shipbuilding purposes. The logs are often perforated with holes, the work of a soft-bodied grub which develops into the puriri moth. These holes do not affect the timber except that it sometimes has to be cut to disadvantage.

The handsome, bright glossy green leaves are three to five foliolate with leaflets 3 to 4 inches long. The pink or red 2-lipped flowers, produced more or less all the year round, are in axillary clusters of four to eight. The roots of the puriri never penetrate deeply into the ground, but lie near the surface, so the tree is easily blown over in a gale. (Adapted from *Laing and Blackwell, Plants of New Zealand, p. 350.*)

For previous introduction, see S. P. I. No. 47881.

55621. ILEX PARAGUARIENSIS St. Hil. Aquifoliaceæ. **Yerba maté.**

From Buenos Aires, Argentina. Plants presented by D. S. Bullock, agricultural commissioner, Bureau of Agricultural Economics, United States Department of Agriculture. Received August 9, 1922.

A small, bushy evergreen tree with alternate serrate leaves, native to Brazil and Paraguay and the neighboring countries. The leaves are roasted and ground to make the Paraguay tea of commerce, which is said to possess the desirable properties of tea and coffee without their injurious aftereffects.

For previous introduction, see S. P. I. No. 55489.

55622. DATURA LEICHHARDTII F. Muell. Solanaceæ.

From Brisbane, Queensland. Seeds presented by C. T. White, Government botanist. Received August 9, 1922.

Introduced for the use of geneticists working on the chromosome behavior of this genus.

A tall coarse herb with irregularly toothed oval leaves 3 to 4 inches long, pale yellowish white flowers about 3 inches in length, and very prickly globular capsules about an inch in diameter. The plant is native in northern Australia. (Adapted from *Bentham, Flora Australiensis, vol. 4, p. 468.*)

55623. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Christiania, Norway. Presented by Dr. N. Wille, director, Botanic Garden. Received August 8, 1922.

"This strain of timothy is from Lierfoss, Norway, where seed culture has been carried on for 20 years." (*Wille.*)

Locally grown seed introduced for timothy breeding experiments.

55624. CITRUS sp. Rutaceæ.

From Johannesburg, Transvaal. Seeds presented by Col. A. J. Bester. Received August 15, 1922.

"When I visited the great Symbabian ruins in central Africa in 1911 I discovered a new citrus fruit; I collected seeds and brought them back, and now the variety is distributed all over the Transvaal. The smooth-skinned fruits are much like a big lime in shape and the abundant fine-flavored juice is very sweet." (*Bester.*)

55625. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratiussima* Gaertn. f.)

From Honolulu, Hawaii. Budwood presented by Gerrit P. Wilder. Received August 16, 1922.

Wilder. Grown by Gerrit P. Wilder at his residence in Honolulu, a seedling from the Guatemalan variety *McDonald* growing at 1402 Punahou Street, Honolulu. An account of the introduction of the *McDonald* from Guatemala is given in Bulletin 25, p. 43, Hawaii Agricultural Experiment Station, as follows:

"About 20 years ago Admiral Beardsley, leaving Guatemala for Hawaii, carried with him a number of avocados for consumption on the way. He saved two seeds, wrapping them in cotton wool and packing them in ice. Arriving in Honolulu, he gave one seed to Judge Wiedeman and the other to Mrs. E. K. Wilder. The former was planted at 1402 Punahou Street, now occupied by 'The McDonald,' and although both seeds grew, the 'McDonald' is far superior in quality and blooms earlier."

A formal description of the fruit of the *Wilder* variety is as follows:

Form nearly round; size large, average weight about 1 pound; stem thick, tough; apex broadly rounded; surface light olive green; flesh yellow, shading into light green near the skin and easily separated from the latter, oily, rich and nutty in flavor; season October to January in Honolulu.

The tree is vigorous, inclined to grow upward rather than to branch out, but can stand pruning. The variety is valuable as a late avocado.

An analysis of the fruit (analysis 1747, University of California, 1915) is as follows: Weight (in ounces)—fruit, 25.70; seed, 6.42; skin, 2.54; edible portion, 16.88. Analysis of edible portion (per cent)—protein, 1.31; fat, 15.87; ash, 0.86; carbohydrates, 5.15.

55626 to 55632.

From the island of Hainan, China. Seeds presented by the Canton Christian College, through F. A. McClure. Received August 14, 1922. Quoted notes by Mr. McClure.

Collected by Mr. McClure in April and May, 1922. The Canton Christian College introduction numbers are in parentheses.

55626. COMBRETUM sp. Combretaceæ.

"(No. 853.) An ornamental shrub about 6 feet high, growing on open hillsides at an altitude of about 1,600 feet."

55627. DIOSPYROS sp. Diospyraceæ. **Persimmon.**

"(No. 856.) A tree 40 to 50 feet high and 2 feet in diameter, growing near the Five Finger Mountains, at an altitude of 3,300 to 5,000 feet. The fruits are eaten by the natives."

55628. FICUS sp. Moraceæ. **Fig.**

"(No. 847.) A small ornamental shrub up to 5 feet in height, collected in sandy soil at an altitude of 100 to 165 feet. The bright-red figs are edible."

55629. PANDANUS TECTORIUS Parkins. Pandanaceæ.

"(No. 858.) This plant, which sometimes reaches a height of 10 or 12 feet if unmolested, is used extensively as a hedge plant in Hainan, chiefly below an altitude of 1,000 feet. The spherical fruits, about 8 inches in diameter, are bright orange-yellow when ripe."

55630. RUBUS sp. Rosaceæ.

"(No. 848.) An edible wild berry found in sandy soil at an altitude of 100 to 165 feet."

55631. RUBUS sp. Rosaceæ.

"(No. 849.) An edible wild berry found in clay loam on hillsides at an altitude of about 3,300 feet."

55626 to 55632—Continued.

55632. CURCUMA ZEDOARIA (Bergius) Roscoe. Zinziberaceæ.

"(No. 857.) Rhizomes of 'hak sam keung' (black-hearted ginger); the flowers are rich pink, and a dark purple in the center of the leaves, as well as in the rhizome, gives the plant its name. It is found most abundantly in sandy soil in thickets and along streams and is a very promising ornamental for semitropical regions"

55633 to 55645. PRUNUS MUME Sieb. and Zucc. Amygdalaceæ. **Japanese apricot.**

From Lokong, Kwangtung, China. Seeds presented by the Canton Christian College, through F. A. McClure. Received August 14, 1922. The Canton Christian College observation numbers are in parentheses.

55633. (No. 601.5–B2) *Cha Ip mui.*

55634. (No. 601.5–C) *Cha Ip mui.*

55635. (No. 601.18) *Hak Lok Tsai mui.*

55636. (No. 601.–E) *Hang mui.*

55637. (No. 601.11–B) *Hank mui chie.*

55638. (No. 601.7–C) *Hung mui.*

55639. (No. 601.6–C–C) *Ngo Shu mui.*

55640. (No. 601.19) *Sun Ngan Au mui.*

55641. (No. 601.10–C) *Tai mui.*

55642. (No. 601.20) *Tai Wang Wat mui.*

55643. (No. 601.4–C2) *Tai Wat Tsing mui.*

55644. (No. 601.4–D) *Tai Wat Tsing mui.*

55645. (No. 601.8–C) *Wang Wat mui.*

55646. MEDICAGO SATIVA L. Fabaceæ. **Alfalfa.**

From Peking, China. Purchased from Dr. R. G. Mills. Received August 19, 1922.

Native-grown seeds introduced for alfalfa breeding experiments.

55647 to 55668.

From Canton, China. Seeds presented by G. Weidman Groff, general director, Canton Christian College. Received May 22, 1922. Numbered September, 1922. Quoted notes by F. A. McClure, of the Canton Christian College.

The Canton Christian College introduction numbers are in parentheses. Native names romanized from the Cantonese dialect.

55647 to 55650. ALEURITES MONTANA (Lour.) Wilson. Euphorbiaceæ. **Mu-oil tree.**

"This is the *mu-yu shu* (literally, wood-oil tree) of southern China. It is less hardy than the tung-oil tree, *Aleurites fordii*, and 2-year-old specimens growing at Tallahassee, Fla., were killed by cold in February, 1917. The oil is practically identical with tung oil. The fruit differs from that of *A. fordii* in having an irregularly ridged surface when mature and the young leaves in being much more deeply lobed than those of that species." (*R. A. Young.*)

55647. "*Shek Lut*, or *Tung Yau Tsz*. Secured in the autumn of 1921 through Rev. F. Fritz, from Moilim, northeastern Kwangtung"

55648. "(No. 785.)"

55649. "(No. 788.)"

55650. "(No. 789.)"

For an illustration of the young tree, see Plate I.



A YOUNG SPECIMEN OF THE MU-YU SHU, OR MU-OIL TREE. (ALEURITES MONTANA (LOUR.) WILSON; S. P. I. NOS. 55647 TO 55650.)

Mu oil, yielded by the seeds of *Aleurites montana*, is practically identical in character with tung oil, obtained from *A. fordii* Hemsl. It is a valuable drying oil, used in the varnish, paint, and many other industries. The mu-oil tree is less resistant to frost than the tung-oil tree, and the specimen here shown, grown at the Live Oak Plantation, Tallahassee, Fla., was killed by the freeze of February, 1917. The leaves of young trees of this species are much more deeply lobed than those of the tung-oil tree. (Photographed by R. A. Young, Tallahassee, Fla., August 11, 1916; P19856FS.)



THE CARAMBOLA, A FAVORITE FRUIT OF SOUTHERN CHINA. AVERRHOA CARAMBOLA L.; S. P. I. NOS. 55651 AND 55652.

The peculiar winged fruits of the carambola are highly acid in character and are eaten by the Chinese with fish, meats, and other foods. When fully ripe they are deep yellow and sweet enough to be eaten out of hand, though they are not greatly relished in this form. The tree can be grown successfully in southern Florida, but it is too tender for cultivation in other parts of the United States. (Photographed by Wilson Popenoe at Rio de Janeiro, Brazil, March 18, 1914; P15001FS.)



AN ATTRACTIVE RELATIVE OF THE MAGNOLIAS. (MICHELIA EXCELSA BLUME; S. P. I. No. 55690.)

As ornamental plants for the warmer portions of the United States the various species of magnolias have acquired great and well-deserved popularity, and it may be expected that *Michelia excelsa*, which belongs to the same family and whose handsome flowers are here shown, will some day be widely cultivated in the southernmost parts of this country. This tall tree is native in the temperate Himalayas of northeastern India at altitudes of about 5,000 feet. The large narrow leaves are silky brown beneath, and the beautiful white flowers are 4 to 5 inches across. (Photographed by J. F. Rock in northeastern India, in 1920; P22780FS.)

55647 to 55668—Continued.

55651 and 55652. AVERRHOA CARAMBOLA L. Oxalidaceæ. **Carambola.**

"Seeds from fruits purchased in the market at Canton by a Chinese student experienced in fruits. Both are cultivated by the natives."

55651. "(No. 651.) *Yeung To.* A sweet variety eaten out of hand."

55652. "(No. 652.) *Saam Nim.* A sour variety."

For an illustration of the fruit and foliage, see Plate II.

55653. CALAMUS sp. Phœnicaceæ. **Rattan.**

(No. 659.) *Wong t'ong.* Collected in December, 1921, from the Five Finger Mountains, interior of Hainan. The long vinelike stems are gathered by natives, dried, and sold to Hakka traders, who export them from Hainan as one of the rattans of commerce."

55654. CASTANOPSIS sp. Fagaceæ.

"(No. 664.) *Kwai lan yui* (Cantonese). Collected near Hongmatsuen, a Loi village in the interior of Hainan. The nuts are used by the natives as food."

55655. CHAENOMELES sp. Malaceæ.

"(No. 650.) *Sz chuen muk kwa.* Purchased in February, 1922, on the street in Canton. The fruit is used by the Chinese in making a rice wine; it makes good jelly and has been tried successfully here at the Canton Christian College."

55656. COIX LACRYMA-JOBI L. Poaceæ. **Job's-tears.**

"(No. 685.) *I mai.* Collected in December, 1921, on the island of Hainan. According to my Chinese assistant, a species of this genus is used by the people of Shinhing, West River, Kwangtung, as fish food, and a famous brand of soft-boned fish is the result."

55657 and 55658. COLOCASIA ESCULENTA (L.) Schott. Araceæ. **Taro.**

"Tubers from the Canton market in September, 1921, and grown in the Canton Christian College gardens for one season."

55657. "(No. 780.) *Hung Nga oo* (red sprouted)."

55658. "(No. 782.) *Paak oo* (white)."

55659 to 55662. DIOSPYROS spp. Diospyraceæ.

55659 and 55660. DIOSPYROS KAKI L. f. **Kaki.**

"*Sai Paat tsz.* Obtained in September, 1921, by a Chinese student of fruits from Lohkongtung, Kwangtung."

55659. "(No. 653.)" **55660.** "(No. 654.)"

55661. DIOSPYROS LOTUS L.

"(No. 655.) *Kaau tsai.* Obtained in Lohkongtung, Kwangtung. A wild species, the pulp of which is used in Canton to make a kind of waterproofing material."

55662. DIOSPYROS sp. **Persimmon.**

"(No. 695.) *Tsz.* Collected from the Five Finger Mountains of the interior of Hainan, near the Loi village of Yiktsokmaau."

55663. MILLETTIA DIELSIANA Harms. Fabaceæ.

"(No. 662.) Collected by F. A. McClure, October 25, near Notia, island of Hainan. This promising ornamental is a shrub in the open, but becomes vinelike when grown in the shade of tall trees. The fruits are the shape and color of oranges and about 2 to 3 centimeters in diameter."

55647 to 55668—Continued.

55664. NAGEIA CUPRESSINA (R. Br.) F. Muell. Taxaceæ.
(*Podocarpus javanicus* Merr.)

"(No. 666.) *Yat poon tsung* (Cantonese). Collected in the Five Finger Mountains, interior of Hainan, in December, 1921. A large tree, becoming 50 meters (164 feet) in height and 2 meters (6½ feet) in diameter. It is a promising ornamental and possibly a timber tree."

For previous introduction, see S. P. I. No. 49546.

55665. PHOENIX sp. Phœnicaceæ. **Palm.**

"(No. 663.) A tree resembling the date palm, with edible fruit. Seeds collected near Noda, island of Hainan, November, 1921."

55666. RUBUS FIMBRIIFERUS Focke. Rosaceæ.

"(No. 657.) *She p'aau lak.* Collected in December, 1921, on open grassy hillsides near Yiktsokmaau, interior of Hainan."

A species of Rubus native to southern China, especially the vicinity of Hongkong; the oval heart-shaped densely hairy leaves are about 4 inches long. The flowers and the red hemispherical fruits appear in the axils of the lower branches. (Adapted from *Focke, Bibliotheca Botanica, vol. 72, p. 80.*)

55667 and 55668. SACCHARUM spp. Poaceæ. **Grass.**

55667. SACCHARUM ARUNDINACEUM Retz.

"(No. 644.) A very tall, promising ornamental grass, collected near Namfung, Hainan, in December, 1921."

55668. SACCHARUM SPONTANEUM L.

"(No. 690.) A promising ornamental grass collected in November, 1921, near Noda, Hainan."

55669 to 55706.

From Darjiling, India. Seeds presented by G. H. Cave, curator, Lloyd Botanic Garden. Received August 2, 1922.

55669. ACER CAMPBELLII Hook. f. and Thoms. Aceraceæ. **Maple.**

One of the principal maples of the northeastern Himalayas, where it grows at an altitude of 7,000 feet or more. The beautiful green leaves with their red stalks make this tree decidedly ornamental. The grayish white moderately hard wood is used for planking and cabinet work. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 69.*)

For previous introduction, see S. P. I. No. 47629.

55670. ALNUS NEPALENSIS D. Don. Betulaceæ. **Alder.**

The Nepal alder is a tall, sparsely branched, rapid-growing deciduous tree found in many places along streams in the temperate Himalayas. The leaves are oval or oblong, and the irregular winged nuts ripen in March. The bark is used for dyeing and tanning, and the rather soft, reddish white wood is used for making boxes. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 176.*)

For previous introduction, see S. P. I. No. 50714.

55671 to 55673. BERBERIS spp. Berberidaceæ. **Barberry.**

55671. BERBERIS INSIGNIS Hook. f. and Thoms.

A beautiful hollylike bush of erect habit, with very few spines and large shining evergreen leaves 3 to 7 inches in length. The golden yellow flowers are borne in clusters of about 15 and are followed by ovoid black berries. Native to the eastern Himalayas. (Adapted from *Hooker, Flora of British India, vol. 1, p. 111.*)

For previous introduction, see S. P. I. No. 47645.

55669 to 55706—Continued.

55672. BERBERIS NAPAULENSIS (DC.) Spreng.

An erect shrub, 3 to 20 feet high, native to the temperate Himalayas at altitudes of 4,000 to 8,000 feet. It is leafy only near the top, the leaves being 6 to 18 inches in length, with leathery leaflets. The flowers are borne in erect dense-flowered racemes, and the bitter, violet fruits are about half an inch in diameter. (Adapted from *Hooker, Flora of British India, vol. 1, p. 109.*)

For previous introduction, see S. P. I. No. 50715.

55673. BERBERIS WALLICHIANA DC.

An evergreen barberry found in forests of the temperate Himalayas at altitudes of 8,000 to 10,000 feet. The leaves are narrow and the flowers, which are borne many in a cluster, are followed by oval or oblong shining black-purple berries. (Adapted from *Hooker, Flora of British India, vol. 1, p. 110.*)

55674. BUCKLANDIA POPULNEA R. Br. Hamamelidaceæ.

A large evergreen tree, up to 80 feet in height, native to the eastern Himalayas at altitudes of 3,000 to 8,000 feet. The wood is grayish brown, close grained, and durable and is very much used in Darjiling for planking and for doors and window frames. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 545.*)

For previous introduction, see S. P. I. No. 47649.

55675. BUDDLEIA COLVILEI Hook. f. Loganiaceæ.

A shrub or small tree 15 to 20 feet high from the vicinity of Sikkim, India, where it is found at altitudes of 9,000 to 12,000 feet. The oblong toothed leaves are about 6 inches long and the crimson flowers, an inch in length, are borne in large loose terminal clusters. (Adapted from *Hooker, Flora of British India, vol. 4, p. 81.*)

55676. CEPHALOSTACHYUM CAPITATUM Munro. Poaceæ. Bamboo.

A bamboo from the hills of Sikkim, India, which develops strong, slender, yellow stems up to 30 feet in height. These stems are used by the natives for bows and arrows, and the leaves are considered good fodder. (Adapted from *Gamble, Manual of Indian Timbers, p. 429.*)

55677. CLEMATIS GREWIAEFLORA DC. Ranunculaceæ.

A large woody climber with densely hairy, deeply 5-lobed leaflets and many-flowered panicles of hairy, tawny yellow flowers, with oblong sepals 1½ inches long. The plant is native to the lower temperate and subtropical Himalayas at altitudes of 3,000 to 5,000 feet. (Adapted from *Johnson's Gardener's Dictionary, p. 230,* and *Hooker, Flora of British India, vol. 1, p. 6.*)

For previous introduction, see S. P. I. No. 33765.

55678. CRACCA CANDIDA (DC.) Kuntze. Fabaceæ.
(*Tephrosia candida* DC.)

A low shrub with slender velvety branches, smooth green leaves 6 to 9 inches long, with gray-silky lower surfaces, and copious terminal and lateral racemes of reddish or white flowers. The shrub is native to the more tropical of the Himalayas, ascending to 5,000 feet altitude. (Adapted from *Hooker, Flora of British India, vol. 2, p. 111.*)

For previous introduction, see S. P. I. No. 50363.

55679. ERIOBOTRYA HOOKERIANA Decaisne. Malaceæ.

A small stout-branched tree with thick leathery oblong sharply toothed leaves up to a foot in length, large panicles of small white flowers, and egg-shaped yellow fruits about three-fourths of an inch long. It is a native of the eastern Himalayas at altitudes of 6,500 to 8,000 feet. (Adapted from *Hooker, Flora of British India, vol. 2, p. 371.*)

For previous introduction, see S. P. I. No. 50717.

55669 to 55706—Continued.

55680. ERYTHRINA ARBORESCENS Roxb. Fabaceæ.

When covered with its bright-scarlet flowers this small tree is very attractive and is often planted as an ornamental, as in the streets of Darjiling. There are but few prickles on its branches, and the thin greenish leaves are often a foot in width. The strongly curved pods are about an inch wide and 6 to 9 inches long. The tree is found native in the central and eastern Himalayas at altitudes ranging up to 7,000 feet. (Adapted from *Hooker, Flora of British India, vol. 12, p. 190,* and *Gamble, Manual of Indian Timbers, p. 122.*)

For previous introduction, see S. P. I. No. 47680.

55681. HYDRANGEA ROBUSTA Hook. f. and Thoms. Hydrangeaceæ.

A very stout, nearly erect hydrangea from Sikkim, India. The short-stemmed oval leaves are coarsely toothed and the flowers, with white sepals, blue petals, and stamens, are borne in rather loose, spreading corymbs with red pedicels. (Adapted from *Curtis's Botanical Magazine, pl. 5038.*)

For previous introduction, see S. P. I. No. 50367.

55682. ILEX INSIGNIS Hook. f. Aquifoliaceæ. **Holly.**

An attractive holly from the Sikkim Himalayas, where it grows at an altitude of 7,000 feet. It forms a small tree or shrub with thick-grooved branches which are purplish when young. The leathery dark-green leaves are pinnately lobed, with the lobes spine tipped and alternately raised and depressed, so that there appears to be a double row of spiny lobes on each side. This holly has proved hardy in Ireland. (Adapted from *Gardeners' Chronicle, 2d ser., vol. 14, p. 292.*)

For previous introduction, see S. P. I. No. 47698.

55683. INDIGOFERA DOSUA TOMENTOSA Baker. Fabaceæ. **Indigo.**

A low shrubby plant with densely hairy branches and dull-green compound leaves 6 to 9 inches in length, each leaf consisting of 40 to 50 leaflets; the bright-red flowers are borne in long racemes. This attractive species is found in temperate regions of the Himalayas at altitudes of 1,000 to 5,000 feet. (Adapted from *Hooker, Flora of British India, vol. 2, p. 152.*)

For previous introduction, see S. P. I. No. 50369.

55684. JASMINUM DISPERMUM Wall. Oleaceæ. **Jasmine.**

A climbing shrub common in temperate regions of the Himalayas at altitudes of 2,000 to 8,000 feet. It bears very numerous white flowers in axillary cymes and terminal panicles, sometimes a hundred. (Adapted from *Hooker, Flora of British India, vol. 3, p. 602.*)

55685. LAUROCERASUS ACUMINATA (Wall.) Roemer. Amygdalaceæ.
(*Prunus acuminata* Hook. f.) **Laurel cherry.**

A slender-branched tree 30 to 40 feet in height, with flat narrow leaves up to 7 inches long and many-flowered racemes of yellowish white flowers. The fruit is a small oval drupe. The tree is found in the central and eastern Himalayas at altitudes ranging from 5,000 to 7,000 feet. (Adapted from *Hooker, Flora of British India, vol. 2, p. 317.*)

For previous introduction, see S. P. I. No. 47705.

55686. LEYCESTERIA BELLIANA W. W. Smith. Caprifoliaceæ.

A small graceful shrub with opposite, membranous, lance-shaped leaves, and sessile, two to four flowered spikes of rosy white flowers. It is native in the Sikkim Himalayas, near the Nepal border, at an altitude of 10,000 feet; it should prove hardy in England. (Adapted from *Transactions and Proceedings of the Botanical Society of Edinburgh, vol. 24, p. 173.*)

55669 to 55706—Continued.

55687. LIGUSTRUM CONFUSUM Decaisne. Oleaceæ.

This relative of our common privet is a small tree, sometimes 40 feet in height, and is native to the mountains of northeastern India at altitudes of 3,000 to 5,000 feet. The narrow leathery leaves are sometimes as much as 3½ inches long, and the small white flowers are borne in dense panicles. (Adapted from *Hooker, Flora of British India, vol. 3, p. 616.*)

For previous introduction, see S. P. I. No. 49640.

55688. MAGNOLIA CAMPBELLII Hook. f. and Thoms. Magnoliaceæ.

A beautiful deciduous magnolia from the Himalayas, where it ascends to 8,000 feet altitude. It reaches a height of 80 feet, has very dark bark, large elliptical dark-green leaves, and white to purple flowers 10 inches in diameter. This magnolia has flowered freely in southern France and Italy. (Adapted from *Curtis's Botanical Magazine, pl. 6793.*)

For previous introduction, see S. P. I. Nos. 47714 to 47718.

55689 to 55691. MICHELIA spp. Magnoliaceæ.

55689. MICHELIA CATHCARTII Hook. f. and Thoms.

A lofty tree with magnolialike foliage and terminal white flowers about an inch in diameter. It is native in the temperate forests of the Sikkim Himalayas, where the moderately hard, dark-brown heartwood is used for planking and for making tea boxes. (Adapted from *Gamble, Manual of Indian Timbers, p. 6,* and *Hooker, Flora of British India, vol. 1, p. 42.*)

For previous introduction, see S. P. I. No. 47730.

55690. MICHELIA EXCELSA Blume.

In the temperate regions of the Himalayas, where this tree is native, it is known as the "white magnolia" and is the principal timber tree of the Darjiling Hills. The oblong leaves have silky brown lower surfaces, and the solitary white flowers are 4 or 5 inches in diameter. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 5, p. 243,* and *Hooker, Flora of British India, vol. 1, p. 43.*)

For previous introduction, see S. P. I. No. 49642.

For an illustration of the flowers of this tree, see Plate III.

55691. MICHELIA LANUGINOSA Wall.

A tall tree with narrow leaves having white, woolly lower surfaces and solitary white flowers 3 to 4 inches across. Although it is spring flowering in most places in northeastern India, where it is native, in Sikkim it is said to form a large bush which flowers in autumn. (Adapted from *Hooker, Flora of British India, vol. 1, p. 43.*)

For previous introduction, see S. P. I. No. 46089.

55692. MORUS LAEVIGATA Wall. Moraceæ. **Mulberry.**

An India mulberry which occurs wild and cultivated, though not common, in the lower Himalayas, where it forms a medium-sized tree with oval leaves up to 7 inches in length. In early spring appear the long-cylindrical, yellowish white or pale-purple fruits; these are edible, although of a rather insipid sweet flavor. (Adapted from *Atkinson, Notes on the Economic Products of the Northwestern Provinces, pt. 5, p. 83.*)

55693. PASPALUM CONJUGATUM Berg. Poaceæ. **Grass.**

A creeping perennial grass with the flowering branches sometimes as much as 3 feet tall. Originally from Dutch Guiana, this species is found in moist places in the Tropics of both hemispheres and forms extensive and close mats. (Adapted from *Contributions from the National Herbarium, vol. 18, p. 318.*)

For previous introduction, see S. P. I. No. 51189.

55669 to 55706—Continued.

55694. PICEA SMITHIANA (Wall.) Boiss. Pinaceæ. Spruce.
(*P. morinda* Link.)

The Himalayan spruce is a lofty tree found in the mountains of northwestern India at altitudes of 7,000 to 11,000 feet; the terminal, drooping pale-green cones are 4 to 6 inches long. The stiff, sharp, spirally arranged green leaves are crowded into hanging, taillike twigs when young. The wood is extensively used for rough furniture and planking. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 4.*)

For previous introduction, see S. P. I. No. 47754.

55695. PIERIS FORMOSA (Wall.) D. Don. Ericaceæ.

A beautiful evergreen Himalayan shrub with leathery finely toothed leaves and large terminal branching clusters of porcelain-white flowers. It has proved hardy in Cornwall, England. (Adapted from *Gardeners' Chronicle, ser. 2, vol. 25, p. 568.*)

55696. PRUNUS NAPAULENSIS (Seringe) Steud. Amygdalaceæ.

A small tree with narrow acuminate leaves, 4 to 6 inches long, and axillary racemes of white flowers. The drupes are about twice the size of a large pea and acid in flavor. This tree is a native of the temperate Himalayas at altitudes of 4,000 to 10,000 feet. (Adapted from *Flora and Sylva, vol. 3, p. 34.*)

For previous introduction, see S. P. I. No. 47767.

55697 to 55701. RHODODENDRON spp. Ericaceæ.

55697. RHODODENDRON ARBOREUM J. E. Smith.

This Himalayan rhododendron is variable both in its foliage and in the color of its flowers. In one form the leaves are silvery on the lower surface, while in another they are covered with a brownish red down. The bell-shaped flowers, borne in dense trusses, vary from deep crimson to pure white. The tree sometimes reaches a height of 35 feet, with a trunk 4 feet in circumference. (Adapted from *Flora and Sylva, vol. 3, p. 34.*)

For previous introduction, see S. P. I. No. 47771.

55698. RHODODENDRON CILIATUM Hook. f.

A Himalayan rhododendron, of somewhat dwarfed habit, bearing many small loose trusses of pinkish white flowers less than 3 inches wide. It rarely exceeds 6 feet in height. (Adapted from *Flora and Sylva, vol. 3, p. 35.*)

For previous introduction, see S. P. I. No. 47772.

55699. RHODODENDRON DALHOUSIAE Hook. f.

This is said to be the finest rhododendron from northeastern India, chiefly because of the great size and beauty of the fragrant flowers, which resemble those of a large lily. It is a straggling shrub, 6 to 8 feet high, with smooth dark-green leaves. The flowers, which occur in terminal clusters of three to five, are nearly 5 inches across. (Adapted from *Curtis's Botanical Magazine, pl. 4718.*)

For previous introduction, see S. P. I. No. 47773.

55700. RHODODENDRON FALCONERI Hook. f.

This shrub or tree, which sometimes attains a height of 30 feet, is a native of northeastern India. The large deep-green leaves, sometimes a foot long, and the whitish, densely clustered flowers make it a very fine ornamental. (Adapted from *Curtis's Botanical Magazine, pl. 4924.*)

For previous introduction, see S. P. I. No. 47774.

55669 to 55706—Continued.

55701. RHODODENDRON MADDENI Hook. f.

An ornamental Himalayan shrub 6 to 8 feet high. The dark-green leaves are from 4 to 7 inches long, with deep-red petioles. The large, delicate, fragrant flowers, white tinged with rose, are borne in threes at the ends of the branches. (Adapted from *Curtis's Botanical Magazine, pl. 4805.*)

For previous introduction, see S. P. I. No. 47776.

55702 and 55703. SAURAUJA spp. Dilleniaceæ.

55702. SAURAUJA FASCICULATA Wall.

A bush or small tree about 20 feet in height, native to the eastern subtropical regions of the Himalayas at altitudes of 2,000 to 4,000 feet. The long narrow leaves are quite hairy, especially beneath, and the flowers, which are first white, then pink, are borne in red-branched cymes. (Adapted from *Hooker, Flora of British India, vol. 1, p. 287.*)

55703. SAURAUJA NAPAULENSIS DC.

A moderate-sized tree with the youngest branches, leaf stems, and midribs covered with rough brown hairs; the narrow, strongly toothed leaves are up to 15 inches in length, the pink flowers are borne in many-flowered panicles, and the edible green fruits have a sweet mealy pulp. The tree is native in the temperate Himalayas at altitudes of 5,000 to 7,000 feet. (Adapted from *Hooker, Flora of British India, vol. 1, p. 286.*)

For previous introduction, see S. P. I. No. 47784.

55704. SKIMMIA LAUREOLA (DC.) Sieb. and Zucc. Rutaceæ.

An evergreen, strongly aromatic shrub, found throughout the temperate Himalayas at altitudes ranging from 6,000 to 10,000 feet. The white flowers are crowded into terminal panicles, and the red, fleshy, oval fruits are about three-fourths of an inch in length. The timber is used to make hoe and ax handles. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 6, pt. 3, p. 411,* and *Hooker, Flora of British India, vol. 1, p. 499.*)

For previous introduction, see S. P. I. No. 47795.

55705. SPIRAEA MICRANTHA Hook. f. Rosaceæ.

A very attractive shrub of rather lax habit, found in the eastern temperate Himalayas at altitudes of 5,800 to 10,000 feet. The narrowly ovate doubly toothed leaves are sometimes 7 inches long, and the small pale-pink flowers are borne in very long spreading panicles. (Adapted from *Hooker, Flora of British India, vol. 2, p. 325.*)

For previous introduction, see S. P. I. No. 47802.

55706. TRACHYCARPUS MARTIANUS (Wall.) Wendl. Phœnicaceæ. Palm.

A slender-trunked fan-leaved palm from temperate regions of the Himalayas, where it grows to a height of 20 to 50 feet. The unarmed trunk bears at its summit a crown of rigid leathery roundish leaves 4 or 5 feet in diameter which are cut about halfway down into narrow 2-lobed segments. The yellow flowers, followed by blue fruits, are borne on a nodding spadix about a foot in length. (Adapted from *Hooker, Flora of British India, vol. 6, p. 436.*)

For previous introduction, see S. P. I. No. 53471.

55707. TRIFOLIUM SUBTERRANEUM L. Fabaceæ.

Subterranean clover.

From Melbourne, Victoria. Seeds purchased from F. H. Brunning & Co. Received August 18, 1922.

"Experiments carried on by the United States Department of Agriculture and by State experiment stations in cooperation with this department during the years 1921 and 1922 have established the fact that this clover will survive the winter as far north as Knoxville, Tenn. At this station, as well as several others, the plants from fall seeding made some growth in the fall, held their own during the winter, and made a rapid and heavy growth early in the spring of 1922. This clover made a strong growth on sandy land at McNeill, Miss.; in this case finely ground bone meal had been used as fertilizer. Preliminary trials have been encouraging, and the department is making further tests." (*A. J. Pieters.*)

For previous introduction, see S. P. I. No. 51212.

55708. PTEROCARPUS sp. Fabaceæ.

From Buenos Aires, Argentina. Seeds presented by D. S. Bullock, agricultural commissioner, Bureau of Agricultural Economics, United States Department of Agriculture. Received August 17, 1922.

"(From Cierras de Vilgo, Independencia, Province of La Rioja, Argentina.) Indian name *chica*, which means 'chew forever' or 'chew always.' The seeds are eaten toasted by the Indians." (*Bullock.*)

55709. ANNONA DIVERSIFOLIA Safford. Annonaceæ. **Ilama.**

From Tapachula, Chiapas, Mexico. Seeds purchased through R. O. Stevenson, British vice consulate. Received August 19, 1922.

"The ilama may be termed the cherimoya of the lowlands. The cherimoya does not succeed in the Tropics unless grown at elevations of 4,000 to 6,000 feet, where the climate is cool. The ilama, on the other hand, belongs to the lowlands, but is strikingly similar in character to a good cherimoya. It is a valuable recruit and one which can not be too strongly recommended for cultivation throughout the Tropics." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 51404.

55710. LOTUS ULIGINOSUS Schkuhr. Fabaceæ.

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. Received August 19, 1922.

A pasture plant of considerable agricultural importance, rather extensively used in New Zealand, from 10 to 15 tons of seed being sown annually. This plant prefers a wet or swampy habitat. It sold in December, 1918, at about a dollar per pound. It is saved for seed mainly in the Auckland Province, but prior to the war the greater portion was imported, mainly from Germany. This seed was exported from the latter country under the name of *Lotus villosus* or *L. uliginosus*, which are the European trade names for the *L. major* of the New Zealand seed trade. *L. major* is very variable with regard to certain characters, such as hairiness, and in consequence several botanical names have been given to the plant. There are apparently a good many different strains, but whether these breed true from seed and are good agricultural species or whether they are due either to the habitat in which they are growing or to fertilization has not yet been ascertained. (Adapted from *The New Zealand Journal of Agriculture, vol. 17, p. 347.*)

Received as *L. villosus*, which is now referred to *L. uliginosus*.

For previous introduction, see S. P. I. No. 48635.

55711. PRINSEPIA SINENSIS Oliver. Amygdalaceæ.

From Jamaica Plain, Mass. Seeds presented by Dr. C. S. Sargent, Arnold Arboretum. Received August 25, 1922.

"*Prinsepia sinensis* is a species which has been comparatively unknown to horticulturists until recent times. It is quite distinct from the Himalayan *P. utilis*, which yields a cooking oil common in India, but is closely similar to *P. uniflora*, which has been introduced by this office several times. Like *P. uniflora* it is a Chinese ornamental shrub with gray or whitish bark and small gray spines. But while *P. uniflora* has white flowers, dark-purple fruits, and thick linear-lanceolate leaves, *P. sinensis* is distinguished by yellow

flowers, deep-red fruits, and thin ovate-lanceolate leaves. The shrub is said to be somewhat hardier than *P. uniflora*. The plant is of striking habit, and the clusters of large bright-yellow flowers must make it a brilliant sight on its native Mongolian hills from Mukden to the Yaloo. It is early blooming, but at the Arnold Arboretum it bears only a few fruits." (*D. C. Peattie.*)

55712. DIOSCOREA ALATA L. Dioscoreaceæ. **Greater yam.**

From Bridgetown, Barbados, British West Indies. Tubers presented by John R. Bovell, Director of Agriculture. Received July 7, 1922.

"*Barbados Red.* The tuber has a purple inner skin, with white flesh usually tinged or mottled with purple. The vine is four angled, with rather prominent maroon wings. The leaves are opposite, broadly ovate, cordate, acuminate; veins maroon; sinus deep and narrow; petioles maroon at base and apex. In the cooked yam the purple color is pale, and the flesh is mealy and of good flavor. The tubers often weigh several pounds each and are usually somewhat cylindrical. This is a standard variety in the West Indies and should be a good market yam for this country." (*R. A. Young.*)

55713. PHYLLOSTACHYS sp. Poaceæ. **Bamboo.**

From Tangsi, Chekiang, China. Plants collected in 1907 by the late Frank N. Meyer, Agricultural Explorer of the United States Department of Agriculture. Received June, 1908. Now numbered for convenience in distribution.

"A small-growing variety not over 10 feet in height, forming dense clumps. The small wiry stems make excellent plant stakes and small fishing rods. It is quite hardy, withstanding freezing temperatures." (*Peter Bisset.*)

Originally introduced under S. P. I. No. 23233 (Meyer's No. 301), but as it does not agree at all with Meyer's note it is necessary to renumber it.

55714. HORDEUM VULGARE PALLIDUM Seringe. Poaceæ. **Barley.**

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received July 8, 1922.

"*Trabut.* A very hardy variety selected from the barleys of North Africa." (*Trabut.*)

55715 to 55717.

From Jamaica Plain, Mass. Presented by Dr. C. S. Sargent, Arnold Arboretum. Received July 5, 1922.

Seeds of the following varieties of the Japanese flowering cherry (*Prunus serrulata* Lindl.) are to be grown for trial as stocks for edible-fruited cherries.

55715. PRUNUS SERRULATA PUBESCENS Wilson. Amygdalaceæ.

A tree up to 55 feet in height, with a trunk sometimes 7 feet in circumference and leaves with pale-green lower surfaces. The white or pink single flowers are usually about four-fifths of an inch in diameter. This variety, known as *Kasumi sakura*, has the widest distribution of any of the Japanese cherries and flowers about two weeks later than *Prunus serrulata spontanea*, from which variety it differs chiefly in the slight hairiness of the leaves. (Adapted from *Wilson, Cherries of Japan, p. 31.*)

For previous introduction, see S. P. I. No. 45709.

55716. PRUNUS SERRULATA SACHALINENSIS (Schmidt) Makino. Amygdalaceæ. **Sargent's cherry.**
(*P. sargentii* Rehder.)

This variety, the *Yama sakura* of northern Japan, is very similar to *Prunus serrulata pubescens*, except that the leaves are not hairy, and the flowers, which are pink or rose colored, rarely white, are usually a little more than an inch in diameter. It is the handsomest of all the wild cherries of eastern Asia and is the parent of several of the finest double-flowered Japanese cherries. (Adapted from *Wilson, Cherries of Japan, p. 35.*)

For previous introduction, see S. P. I. No. 46533.

55715 to 55717—Continued.

55717. PRUNUS SERRULATA SPONTANEA (Maxim.) Wilson. Amygdalaceæ.

In Japan this variety is a common wild tree in the woods and thickets from Kagoshima in the south to the Nikko region in the north, where it forms a tree over 75 feet in height with a trunk 15 feet in circumference. In habit and color of flowers this variety agrees closely with the northern *Prunus serrulata sachalinensis;* the flowers are white or pink and a little less than an inch in diameter. It is the *Yama sakura* of southern and central Japan. (Adapted from *Wilson, Cherries of Japan, p. 28.*)

For previous introduction, see S. P. I. No. 41577.

55718 to 55721.

From Likiang, Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received July 3, 1922. Quoted notes by Mr. Rock.

55718. BERBERIS DICTYOPHYLLA Franch. Berberidaceæ. **Barberry.**

"(No. 3388. May 15, 1922.) A fine yellow-flowered, somewhat spiny shrub which grows on limestone soil in the Likiang Mountains at an altitude of 12,000 feet. The fruits are a brilliant red, and the shrub would make an excellent ornamental."

For previous introduction, see S. P. I. No. 49056.

55719. PRINSEPIA UTILIS Royle. Amygdalaceæ.

"(No. 3281. Lashihpa, May 10, 1922.) A spiny shrub of great ornamental value, which grows north of Talifu on limestone soil at altitudes of 8,000 to 10,000 feet. In December and January the pendent branches bear a great profusion of white flowers. A cooking oil is expressed from the seeds, which are gathered by the Chinese and native tribes."

For previous introduction, see S. P. I. No. 42623.

55720. PRUNUS sp. Amygdalaceæ. **Cherry.**

"(No. 3256. May 9, 1922.) A wild cherry which forms a large spreading tree 50 feet high with a trunk up to 2 feet in diameter; it grows at 8,500 feet altitude in forests beyond Chinho. It should be a fine tree for stock purposes; it bears large numbers of small yellow fruits."

55721. ROSA sp. Rosaceæ. **Rose.**

"(No. 3238. Lashihpa, May 10, 1922.) A fine climbing rose which grows in great profusion at 8,000 feet altitude near Likiang. It is a prolific bloomer, bearing large corymbs of flowers which are at first yellow, but become white when fully opened."

For an illustration of this rose, see Plate IV.

55722. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From London, England. Seeds presented by Walter S. Tower, American commercial attaché, London, through the Bureau of Foreign and Domestic Commerce, United States Department of Commerce. Received July 3, 1922.

Introduced for department agrostologists.

55723. MAGNOLIA CAMPBELLI Hook. *f.* and Thoms. Magnoliaceæ.

From Darjiling, India. Seeds presented by G. H. Cave, curator, Lloyd Botanic Garden. Received July 3, 1922.

A beautiful deciduous magnolia from the Himalayas, where it ascends to 8,000 feet above sea level. It reaches a height of 80 feet, has very dark bark,



A NEW WILD ROSE FROM SOUTHWESTERN CHINA. (ROSA SR., S. P. I. No. 55721.)

This beautiful climbing rose was discovered by J. F. Rock on a high plateau in the center portion of the Himalaya mountains, western China at 8,000 feet altitude. The flowers, at first yellow but later becoming a delicate creamy white, are single and are borne in large clusters. Photographed by J. F. Rock on the Lushija Plain, Yunnan, China, May 11, 1922. PRICE 5 c



A NEW HYBRID PEAR. (PYRUS SEROTINA × COMMUNIS; S. P. I. No. 55805.)

The Van Fleet pear, a hybrid produced by the late Dr. Walter Van Fleet at Little Silver, N. J., merits the serious attention of fruit growers because the tree appears to be resistant to fire-blight and at the same time the fruit is excellent for cooking and preserving. The pear is medium to large, with golden-yellow skin and sweet whitish flesh. The tree is vigorous, with large, thick, glossy leaves. No trace of blight has appeared in the two original trees which have been growing for 10 years at the Plant Introduction Garden, Chico, Calif. (Photographed by E. L. Crandall, September 12, 1922; P27943FS.)

large elliptical dark-green leaves, and white to purple flowers 10 inches in diameter. This magnolia has flowered freely in southern France and Italy. (Adapted from *Curtis's Botanical Magazine, vol. 111, pl. 6793.*)

For previous introduction, see S. P. I. No. 47718.

55724. MEDICAGO SATIVA L. Fabaceæ. **Alfalfa.**

From Lima, Peru. Seeds presented by W. E. Dunn, acting commercial attaché, through the Department of Commerce, Washington, D. C. Received July 3, 1922.

"This Peruvian alfalfa is known as 'San Pedrana.' Sr. Carlos Alvarez Calderón, who obtained the sample for us, says that it was grown in the coast region and may be harvested every 45 days throughout the year, whereas from the ordinary variety 'del pais' only about six cuts per year can be obtained." (*Dunn.*)

Peruvian alfalfa has proved of great value in certain parts of the United States. In the hope of originating new strains which may be superior in certain respects to any now grown in this country, an effort is being made to obtain seed from as many different regions in Peru as possible. The following note is adapted from H. L. Westover, in "The Development of the Peruvian Alfalfa Industry in the United States," United States Department of Agriculture Circular 93:

As compared with common alfalfa, both types of Peruvian alfalfa are more upright, less branched, and have fewer and somewhat coarser stems and smaller crowns. In thick stands, these differences are hardly noticeable. Most of the Peruvian introductions are also characterized by rapid growth, quick recovery after cutting, and in sections having a mild climate ability to make growth in cool weather after ordinary alfalfas have ceased growing. Under such conditions the Peruvian alfalfas start growth earlier in the spring and continue later in the fall, thereby giving more cuttings each season. The principal objection advanced in times past to these alfalfas is their tendency to become somewhat woody when allowed to stand beyond the flowering stage, but this difficulty is easily obviated by earlier harvesting. Lack of hardiness will always confine the successful production of the true and smooth Peruvian alfalfas to the southern and southwestern portions of the United States, where the climatic conditions are comparatively mild. They can not be grown to advantage where the winter temperature falls below 10° F. At the present time most of the Peruvian and smooth Peruvian alfalfa in the United States is found in Arizona and California. It has also been grown to a limited extent in New Mexico, Texas, and the coastal regions of the Southeastern States. The results seem to indicate that in much of this region the common alfalfa could be replaced very profitably by the Peruvian varieties.

55725. PRUNUS ARMENIACA L. Amygdalaceæ. **Apricot.**

From Algiers, Algeria. Seeds presented by Dr. L. Trabut. Received July 3, 1922.

"A native apricot known as *louz*; the tree is very productive and the fruit excellent. This tree is cultivated at M'Sila, a subarid region." (*Trabut.*)

55726. FRAGARIA ROSEIFLORA Boulay. Rosaceæ. **Strawberry.**

From Chenebourg, near Geneva, Switzerland. Seeds purchased from H. Correvon, Floraire Nursery. Received July 11, 1922.

Introduced for experiments in strawberry breeding.

This is very closely allied to *Fragaria vesca*, from which it is distinguished by its round, uniformly pink petals and its roundish depressed fruits. It is found wild on the slopes of the Vosges Mountains in Alsace. (Adapted from *Bulletin de la Société de France, vol. 18, p. 92.*)

55727. CERATONIA SILIQUA L. Cæsalpiniaceæ. **Carob.**

From Bari, Italy. Budwood presented by Dr. E. Pantanelli, director, Agricultural Experiment Station. Received July 7, 1922.

"*Améle.* This is considered the best variety of carob cultivated in this province (Bari); it may be the kind with large sweet pods which has been reported to you from this region." (*Pantanelli.*)

55728. GARCINIA MANGOSTANA L. Clusiaceæ. **Mangosteen.**

From Peradeniya, Ceylon. Seeds purchased through H. F. McMillan, Botanic Garden, Peradeniya. Received August 31, 1922.

Introduced for the purpose of establishing the mangosteen in our tropical dependencies.

"This delicious fruit is about the size of a mandarin orange, round and slightly flattened at each end, with a thick, smooth, rich red-purple rind, which, when cut, exposes the white segments lying loose in the cups. The cut surface of the rind is a most delicate pink. The separate segments are whitish and covered with a delicate network of fibers. The texture of the pulp resembles that of the plum, and the flavor is indescribably delicious." (*David Fairchild.*)

For previous introduction, see S. P. I. No. 55496.

55729. PRUNUS ARMENIACA L. Amygdalaceæ. **Apricot.**

From Likiang, Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received August 26, 1922.

"(Nguluke, Likiang Valley. June 25, 1922.) The trees are 45 feet or more high and found in this region at altitudes of 8,000 to 9,200 feet. They are apparently free from disease and should make good stock plants. The small, sour, rich-red fruits are deliciously fragrant and are excellent for jam or for stewing." (*Rock.*)

55730. LILIUM sp. Liliaceæ. **Lily.**

From Likiang, Yunnan, China. Bulbs collected by J. F. Rock. Received August 30, 1922.

"(No. 4756. Nguluke, near Likiang. June 27, 1922.) This may be a variety of *Lilium sutchuenense.* The plant, which grows on the Likiang Range at an altitude of 11,000 feet, is about 4 feet tall, with linear-lanceolate leaves and large brightly colored reddish yellow flowers spotted with a rich purple." (*Rock.*)

55731. ORYZA SATIVA L. Poaceæ. **Rice.**

From Szemao, Yunnan, China. Seeds collected by J. F. Rock. Received August 30, 1922.

"(Szemao, Yunnan. March 11, 1922.) A bright-red rice of fine grade, called *tzu no mi* by the Chinese and sold in Szemao." (*Rock.*)

55732. PRUNUS MAJESTICA Koehne. Amygdalaceæ. **Cherry.**

From Talifu, Yunnan, China. Seeds collected by J. F. Rock. Received August 30, 1922.

"(No. 3174. Talifu, Yunnan. April 25, 1922.) A fine large tree, 60 to 70 feet in height, of *Prunus pseudo-cerasus* type, found in the foothills of Talifu at altitudes of 6,700 to 7,000 feet. The tree from which these seeds were collected had three trunks clothed with a smooth, shining, bronze-colored bark with horizontal bands speckled with white. Each trunk was over a foot in diameter, the branches were stout and erect, the foliage dark green, and the fruits small, oblong, reddish, and cherrylike in appearance." (*Rock.*)

55733. CARICA PAPAYA L. Papayaceæ. **Papaya.**

From Bangkok, Siam. Seeds presented by Lao Leng Hui, clerk, American Legation. Received September 1, 1922.

A mixed collection of papayas from Bangkok, Siam, for trial in southern Florida. The Siamese papayas are recommended by the Hon. W. P. Hunt,

former American Minister to Siam, as of unusually good quality and free from the objectionable odor which characterizes those of many other countries.

55734. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Budapest, Hungary. Presented by the Hungarian Seed Culture Co. Received August 29, 1922.

Locally grown seed introduced for timothy breeding experiments.

55735. MYRICA RUBRA Sieb. and Zucc. Myricaceæ. **Yang mae.**

From Yokohama, Japan. Seeds purchased from the Yokohama Nursery Co. Received August 31, 1922.

"The beautiful dark-purple fruits are the size of crab apples and can be eaten out of hand or made into compotes and pies. There is great variation in the habit and productivity of the trees and also in the color, size, and taste of the fruits. The trees are evergreen and thrive best on well-drained rocky terraces. The localities that will best suit them in the United States will probably be the southern sections of the Gulf Coast States and the milder parts of California. Chinese name *yang mae*." (*Frank N. Meyer.*)

For previous introduction, see S. P. I. No. 53982.

55736. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

From Laguna, Guatemala. Budwood collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received October, 1916. Numbered September, 1922.

This variety was not distributed along with others introduced from Guatemala in 1916–17, as no buds were saved at Washington, and only one was successfully established at Miami, where several budsticks of the original shipment were sent. For a year or more the variety was considered to be lost. When it came into bearing, less than two years after the original buds were top-worked on an old tree of the West Indian race at the Miami Plant Introduction Garden, the variety was seen to be sufficiently meritorious to justify a wider trial. In habit and character of growth it is excellent; the branches are strong, not drooping, and the growth vigorous. The fruits, which ripen at Miami in late winter and early spring, are slender pyriform, about 18 ounces in weight, dark green, with the surface somewhat rough; the skin is thick and woody and the flesh cream yellow, smooth, and free from fiber, of rich flavor and excellent quality. The seed is rather small and tight in the cavity.

The original note on this variety is as follows:

"(No. 41. Laguna, Guatemala. October 2, 1916.) Avocado No. 2. *Itzamna*. A fruit of good size, having a very small seed and flesh of good quality and ripening very early in the season. The tree does not seem to be a very heavy bearer, but it is in such condition that it is difficult to say what its behavior may be under more favorable culture.

"The parent tree is growing among coffee bushes in the finca of Don Miguel Soto, a few hundred yards from the northern shore of Lake Amatitlan, at an altitude of 3,900 feet. The soil is a heavy black loam, rich and moist. The tree is about 25 feet high, with a trunk 1 foot in diameter and a rather scanty top. The amount of fruit which it is ripening this year (1916) is not great, but the crop may be considered a fair one.

"Following is a description of the fruit:

"Form oblong-pyriform, not necked; size above medium, weight 14 to 16 ounces, length 5¼ inches, greatest breadth 3¼ inches; base rounded, with the stem insertion nearly central; stem moderately stout, 5 inches long; apex rounded; surface pebbled, light green to yellowish green, with fairly numerous yellowish dots; skin slightly less than one-sixteenth of an inch thick at base of fruit, more than one-sixteenth of an inch thick at apex, separating readily from the flesh, brittle, and granular in texture; flesh pale cream, greenish near the skin, firm, with very slight fiber markings toward the base of the fruit; flavor nutty; quality very good; seed very small, ovate-conic in form, 1¾ inches long, 1½ inches thick, with both seed coats adhering closely and tight in the cavity.

"The fruit reaches maturity by the end of September at Lake Amatitlan and is then picked for market, but the quality would doubtless be much better if it were left on the tree some time longer. In excessively wet weather the fruits fall as soon as they are mature. With less soil moisture they hang on longer." (*Wilson Popenoe.*)

55737. Tabebuia pentaphylla (L.) Hemsl. Bignoniaceæ.

From St. Croix, Virgin Islands. Seeds presented by J. B. Thompson, agronomist in charge, Agricultural Experiment Station. Received August 25, 1922.

This tree is native in the West Indies and Central America and is often cultivated as an ornamental.

"The *matiliscuate* is a handsome flowering tree found in north-central Guatemala, especially in the Valley of Salama, and commonly growing near small streams. I have seen it at altitudes of 2,000 to 3,500 feet. The tree is about 35 feet high at maturity, with a spreading crown, deciduous during the latter part of the dry season (January to March), and producing large clusters of pink flowers which make the tree a mass of color visible for some distance. Its flowering season is from January to March, and the seeds, which are produced in long slender pods, ripen in May and June.

"As an ornamental tree for cultivation in southern Florida and possibly also in California, the *matiliscuate* seems well worthy of trial. The only defect of this plant is the habit of dropping its leaves during the dry months of the year. If it flowers in the same months in Florida as in Guatemala, it should be a valuable addition to the flowering trees of that region. It thrives on heavy but rocky land and does not seem to require a large supply of water." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 44998.

55738. Paullinia cupana Kunth. Sapindaceæ. Guarana.

From Rio de Janeiro, Brazil. Seeds presented by Dr. J. Simão da Costa, through Dr. W. L. Schurz, commercial attaché of the American Embassy. Received September 6, 1922.

A stout, bushy vine found wild in Venezuela and northwestern Brazil and also cultivated in the latter country for the sake of the grapelike fruits, from which is obtained the product known as guarana. This, in the form of a black paste, has received considerable attention in the pharmaceutical world in recent years as a natural source of caffein.

The following analysis shows the composition of guarana:

	Per cent.		Per cent.
Caffein	5.388	Starch	9.350
Essential oil	2.950	Glucose	.777
Resin	7.800	Pectic acid, malic acid, dextrin, etc	7.470
Coloring matter	1.570	Vegetable fiber	49.125
Saponin	.060	Water	7.650
Guarana-tannic acid	5.902		
Pyro-guarana acid	2.750		

Owing to the fact that guarana is so rich in caffein, a small dose enables a man to endure extraordinary hardship, and taken sparingly it is said to be excellent for intestinal trouble.

The Mauhe district in Para, Brazil, produces about 25 tons of guarana paste annually, and the cultivation of the plant has recently been begun in the States of Goyaz and Rio de Janeiro. A number of new and successful pharmaceutical compounds contain this product. (Adapted from *Bulletin of the Pan American Union, vol. 51, p. 268.*)

55739 to 55747.

From Avondale, Auckland, New Zealand. Budwood and trees presented by H. R. Wright. Received September 13, 1922. Quoted notes by Mr. Wright.

55739 to 55747—Continued.

55739 to 55742. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

55739. "Dormant buds of *Kings Seedling*. A white-fleshed clingstone variety, with the skin uniformly of a beautiful red."

55740. "Dormant buds of *Sunrise*. One of the earliest varieties, of high color and superb quality. The tree is sturdy, close jointed, and a good cropper."

55741. "Dormant buds of *Watts Early*. A variety that might be suitable for Florida because of its short resting period. It starts its growth nearly a month before any other variety; consequently should not be planted in districts subject to late frosts. The ripening season is extra early."

55742. "*White Cling*. Tree belonging to a variety found growing near a native hut in the Coromandel district. It is said to bear heavy crops of fine-flavored, very juicy fruits."

55743. CITRUS SINENSIS (L.) Osbeck. Rutaceæ. **Orange.**

"*Grovery Navel*. Trees of a Queensland variety with fruits of large size. This variety is an enormous cropper and well worth a trial."

55744. MALUS SIEBOLDII (Regel) Rehder. Malaceæ.

"Selected trees which are aphis resistant, but not suitable as stock plants, lacking affinity. They are essentially ornamentals, having very pretty foliage and being very handsome while in fruit."

55745 to 55747. PRUNUS SALICINA × CERASIFERA. Amygdalaceæ. **Hybrid plum.**

55745. "Dormant buds of *Ford's Early*(?)."

55746. "Dormant buds of *Ford's Early*. A hybrid plum which is early ripening and a good cropper."

55747. "Dormant buds of *Norris Early*. Said to be a hybrid plum."

55748 to 55750.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received September 12, 1922.

55748. INDIGOFERA DOSUA TOMENTOSA Baker. Fabaceæ. **Indigo.**

For previous introduction and description, see S. P. I. No. 55683.

55749. MIMOSA RUBICAULIS Lam. Mimosaceæ.

A large, straggling, prickly shrub found throughout the greater part of India, ascending to 5,000 feet in the western Himalayas. The leaves, seeds, pods, and powdered roots are used by the natives medicinally. It is said to make a very satisfactory hedge plant. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 5, p. 249.*)

For previous introduction, see S. P. I. No. 47734.

55750. NICOTIANA SYLVESTRIS Speg. Solanaceæ. **Tobacco.**

An ornamental tobacco from Argentina which has the double merit of large handsome leaves and a free-flowering habit. Its white sweet-scented flowers are very attractive, but should be shaded from the direct rays of the midday sun. (Adapted from *The Gardeners' Magazine, vol. 52, p. 48.*)

For previous introduction, see S. P. I. No. 42344.

55751 to 55753.

From Mili, Szechwan, China. Tubers and bulbs obtained by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received September 12, 1922.

55751 to 55753—Continued.

55751 and 55752. LILIUM spp. Liliaceæ. **Lily.**

55751. LILIUM sp.

"(July, 1922.) A tall plant with purplish white flowers borne in twos or threes; collected in the mountains."

55752. LILIUM sp.

"(No. 5054. July 12, 1922.) A rather rare species with pink flowers speckled with purple, found in the mountains at an altitude of 12,000 feet."

55753. (Undetermined.)

"(No. 5053. July, 1922.) Tubers collected in the mountains."

55754. HYPERICUM CANARIENSE L. Hypericaceæ.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received September 15, 1922.

"A small graceful tree with drooping branches, which will grow on the driest and poorest of soils. The wood is the strongest I have ever seen: it is almost impossible to drive a nail into it. The boys here use its thin straight stems as net handles, all other kinds of wood breaking under the strain of pushing the net through the water. I should think that such remarkably strong wood which can be produced on such poor soil would have a practical value." (*Proschowsky.*)

For previous introduction, see S. P. I. No. 47581.

55755. RUBUS sp. Rosaceæ. **Blackberry.**

From San Jose, Costa Rica. Seeds collected by Edward Goucher, Plant Propagator, Bureau of Plant Industry. Received September 14, 1922.

"The fruits of this species of Rubus were collected at Paraiso, near San Jose, Costa Rica. The plants grew along the roadside and were from 6 to 8 feet in height. The fruits, which were produced in abundance, were about 1 inch in length and very firm in texture, but of poor flavor." (*Goucher.*)

55756 to 55761.

From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received September 11, 1922. Quoted notes by Mr. Rock.

55756. LILIUM sp. Liliaceæ. **Lily.**

"(No. 4931. Likiang. July 7, 1922.) Bulbs of a beautiful lily with thick, oval, alternate leaves which are far apart. The single terminal flower has rich pink reflexed petals spotted with dark purple. This rare plant grows on the edge of pine forests of the Likiang Snow Range at an altitude of 12,000 feet. This may be only a variety of *Lilium duchartrei*, but it is a decidedly handsome plant."

55757 to 55761. PRUNUS spp. Amygdalaceæ.

Seeds of the following wild cherries and plums:

55757. PRUNUS sp. **Cherry.**

"(Likiang, July 6, 1922.) A smaller tree than the following [No. 4858, S. P. I. No. 55758]; the fruits also are smaller, globose, and dark red. It grows in the Likiang Snow Range at an altitude of 12,000 feet. The tree is apparently free from any disease."

55758. PRUNUS sp. **Cherry.**

"(No. 4858. Likiang, July 6, 1922.) A fine looking cherry tree, 35 to 40 feet in height, which grows at an altitude of 12,000 feet among limestone bowlders on the edge of alpine meadows on the

55756 to 55761—Continued.

Likiang Snow Range. The foliage is dark green, and the orange-red, oval-pointed, sour fruits are much sought after by birds and hence difficult to collect."

55759. PRUNUS sp. **Plum.**

"(Szemao. July, 1922.) A plum tree of fine shape, 40 to 50 feet in height, growing in the mountains at an altitude of 5,000 feet or more. The small yellow fruits, about the size of an olive, are not very sour; the flesh is scanty but quite tasty."

55760. PRUNUS sp. **Plum.**

"(Szemao. July, 1922.) A plum tree growing in the mountains at an altitude of 5,000 feet."

55761. PRUNUS sp. **Plum.**

"(Szemao. July, 1922.) A plum tree, 30 to 35 feet in height, growing in the mountains at an altitude of 5,000 feet or more. The fruit, somewhat larger than an olive, is yellow, hard, and sour. Owing to its freedom from disease and prolific bearing, this species, as well as the two preceding ones, should be suitable for stocks."

55762. GARCINIA MANGOSTANA L. Clusiaceæ. Mangosteen.

From Paris, France. Seeds purchased from Vilmorin-Andrieux & Co. Received September 6, 1922.

For previous introduction and description, see S. P. I. No. 55728.

55763. ACANTHOSICYOS HORRIDA Welw. Cucurbitaceæ.

From Louws Creek, Eastern Transvaal, Union of South Africa. Seeds presented by E. B. Edwards. Received September 14, 1922.

"*Narras.* A remarkable cucurbitaceous plant which grows on the dunes of the Namib, where subterranean waters exist. The plant subsists even when this water is at great depths. It forms thorny thickets on the sand hills of Southwest Africa and is adapted to a hot, dry climate, with little or no rainfall. The fruit is the size of an ostrich egg. Both the pulp and seeds are used as food by the natives. The fruits are produced in abundance, and for about four months of the year the more primitive Hottentots are said to survive with practically no other source of food or water. The fruits are eaten and water is obtained from them. The seeds when ripe are plump, about the size of watermelon seeds.

"The plant is one which should be of great value to our Indians of the Southwest if once established on the sand dunes of Arizona and southern California. It is doubtful whether any plant can be obtained which seems offhand to give greater promise in that region than does this cucurbit." (*H. L. Shantz.*)

For previous introduction, see S. P. I. No. 55486.

55764 and 55765. PRUNUS SEROTINA Ehrh. Amygdalaceæ. Capulin.

From the city of Guatemala, Guatemala. Seeds presented by Sr. Jorge Garcia Salas, Director General of Agriculture. Received August 17, 1922.

"In Guatemala this tree is found throughout the highlands generally, sometimes as a semicultivated plant, sometimes as a wild species, or at least having the appearance of one. Its zone of cultivation lies between 4,000 and 9,000 feet. The Kiche Indians who live near Quezaltenango know the fruit as 'tup' and distinguish two varieties—the 'ek-i-tup' (red tup) and the 'sak-i-tup' (white tup), the latter having fruits of much lighter color than the former. The presence of a name for this fruit in the Kiche language argues an ancient cultivation in the Guatemalan highlands.

"The capulin is used in the same manner as the northern cherry—for eating out of hand, for preserving, for jams, etc. In those countries where good varieties grow it is popular among all classes of people.

"There is considerable difference in flavor of the fruits from different trees of a given region where this species grows, some of the fruits being disagreeably bitter, while others are sweet, pleasant, and altogether delicious. It is these latter which must be sought out and propagated if the possibilities of the capulin are to be fully realized and if it is to become eventually, as we confidently believe it will, a popular fruit throughout the subtropical regions of the entire world." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 41328.

55764. "A bitter cherry from cool regions of Chimaltenango." (*Garcia Salas.*)

55765. "A sweet cherry from cool regions of San Martin Jilotepeque." (*Garcia Salas.*)

55766 to 55768. Cucumis spp. Cucurbitaceæ.

From Burringbar, New South Wales. Seeds presented by B. Harrison. Received September 14, 1922. Quoted notes by Mr. Harrison.

55766. Cucumis melo L. **Muskmelon.**

"Seeds of the Australian casaba which I believe originally came from India. It is a most prolific plant, bearing cream-colored fruit about the size of a cucumber. It is sometimes called the 'apple melon' and is quite popular here, being very palatable when eaten with sugar or made up into pies. It is hardy, prolific, early, and should thrive well throughout the United States."

For previous introduction, see S. P. I. No. 46029.

55767 and 55768. Cucumis sativus L. **Cucumber.**

55767. "*Mammoth.* This cucumber grows to a very large size, almost as large as a medium-sized vegetable marrow, and keeps well. The flesh is very firm, crisp, and sweet."

For previous introduction, see S. P. I. No. 48156.

55768. "*Harrison's Giant.* Grows to a length of 3 feet and is well flavored. This variety has been evolved through careful selection and cultivation."

55769. Caragana pygmaea (L.) DC. Fabaceæ. Dwarf pea tree.

From Indian Head, Saskatchewan, Canada. Seeds presented by Norman M. Ross, Forestry Branch, Nursery Station, Indian Head. Received September 15, 1922.

A handsome shrub with small leaves and yellow flowers, which grows spontaneously in hilly places in the southern provinces of Russia, and in great abundance in the region south of Lake Baikal. In cultivation it rarely exceeds 4 feet, but in its wild state it is often 6 feet high with a stem 2 inches thick. The bright-yellow shoots when old are long and flexible and are made into flyflaps. The shoots are much tougher than those of any of our cultivated osiers and are better suited for tying. The hard dull-brown wood is streaked with red and is well adapted for veneering. (Adapted from *Edward's Botanical Register, vol. 12, p. 1021.*)

For previous introduction, see S. P. I. No. 52698.

55770. Lilium sp. Liliaceæ. Lily.

From Mili, Szechwan, China. Bulbs collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received September 15, 1922.

"(No. 5051. Mili, July 10, 1922.) A lily related to *Lilium duchartrei*, with large racemes of white flowers; the petals are reflexed and sprinkled with purple. The bulbs were collected in southwestern Szechwan, in the mountains of the Lama Kingdom." (*Rock.*)

55771 to 55774.

From Komaba, Tokyo, Japan. Seeds presented by Prof. M. Shirai, Botanical Institute, College of Agriculture, Komaba. Received September 19, 1922.

55771 and 55772. ELAEAGNUS MULTIFLORA Thunb. Elæagnaceæ. **Gumi.**

A very attractive white-flowered Japanese shrub about 6 feet in height. The lower surface of the oval leaves is silvery white and the dull-red oval fruits, about an inch in length, are much relished for their brisk tart flavor, being excellent for preserves. (Adapted from *The Florists' Exchange, vol. 38, p. 185.*)

55771. *Ogumi.* **55772.** *Togumi.*

55773 and 55774. RUBUS spp. Rosaceæ.

These native Japanese species of Rubus are introduced for breeding experiments.

55773. RUBUS INCISUS Thunb.

An erect shrubby species with purplish stems, few spines, heart-shaped leaves, and solitary axillary white flowers. (Adapted from *Thunberg, Flora Japonica, p. 216.*)

55774. RUBUS MICROPHYLLUS L. f.
(*R. palmatus* Thunb.)

A much-branched shrub with slender climbing branches, scattered recurved prickles, roundish five or six lobed bright-green leaves, solitary axillary pure-white flowers, and yellow juicy fruits nearly an inch in diameter. (Adapted from *Curtis's Botanical Magazine, pl. 7801.*)

55775 to 55787.

From China. Collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received September 21, 1922. Quoted notes by Mr. Rock.

55775 and 55776. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

55775. "(Near Puerhfu, Yunnan. July, 1922.) Seeds of a tree 40 feet in height, which is a prolific bearer. The fruits are unusually fine, although small; they are juicy and of a delicious strawberry-like flavor, freestone, and with a strawberry-red surface."

55776. "(Puerhfu, Yunnan. July 10, 1922.) Seeds from large trees growing wild in the mountains 30 li [about 8 miles] from Puerhfu at an altitude of 5,000 feet. The fruits are large, freestone, quite juicy, and of good flavor."

55777. ARISAEMA sp. Araceæ.

"(No. 5053. Mili, Szechwan. July 12, 1922.) Tubers of an aroid of great beauty collected in the mountains. The large spathe is white, with a tinge of pale green toward the apex."

55778 to 55780. LILIUM spp. Liliaceæ. **Lily.**

55778. LILIUM sp.

"(Likiang, Yunnan. July, 1922.) Bulbs of a lily with red stems, dark-green leaves, and yellowish red flowers; the reflexed petals are spotted with purple. This lily was found on the western slope of the Likiang Snow Range at an altitude of 14,000 feet."

55779. LILIUM sp.

"(Likiang, Yunnan. July 20, 1922.) Bulbs of a small lily with single white flowers; found on the Likiang Snow Range at an altitude of 14,000 feet."

55775 and 55787—Continued.

55780. LILIUM sp.

"(Likiang, Yunnan. July, 1922.) Bulbs of a lily with red stems and thick, fleshy, light-green leaves, collected on the eastern slope of the Likiang Snow Range at an altitude of 14,000 feet. The yellowish green flowers are marked with purple stripes."

55781 to 55784. PRUNUS spp. Amygdalaceæ.

55781. PRUNUS TOMENTOSA Thunb. **Bush cherry.**

"(Likiang, Yunnan. July 18, 1922.) Seeds of a shrubby cherry which grows on the Yunnan-Szechwan border about five days' journey north of Likiang in the scrub forests near Fengkow, not far from the Yangtze River, at an altitude of 11,000 feet. The plant is 8 to 10 feet high, with a gray pubescence, branching from the base and forming a large round bush. It is a most prolific bearer, and in the latter part of July is loaded with the oval orange-yellow cherries of a sweetish sour flavor."

55782. PRUNUS sp. **Cherry.**

"(No. 5052. Mili, Szechwan. July 10, 1922.) Seeds of a fine spreading tree 35 to 40 feet in height, collected in the mountains at an altitude of 12,000 feet. The small oval red fruits have very small seeds. The tree should make a good stock plant."

55783. PRUNUS sp. **Plum.**

"(Near Puerhfu, Yunnan. July, 1922.) Seeds of a fine tree which bears bright-yellow, very juicy fruits of a mild, sweet flavor, the size of a small apple. This species could doubtless be improved."

55784. PRUNUS sp. **Plum.**

"(Near Puerhfu, Yunnan. July, 1922.) Seeds of a tree 35 to 40 feet high, with bright-yellow, slightly bitter fruits the size of a small walnut."

55785 to 55787. RUBUS spp. Rosaceæ. **Raspberry.**

55785. RUBUS sp.

"(Likiang, Yunnan. July, 1922.) Seeds of a rambling shrub collected on the Likiang Snow Range at an altitude of 15,000 feet in exposed situations covered with snow in winter and early spring. The entire plant is woolly white and slightly spiny, and the leaves are snow white beneath. The fruits, the size of a thimble, have a sweet, delicious flavor, and the individual drupelets are large and transparent."

55786. RUBUS sp.

"(Likiang. July 20, 1922.) Seeds of a climbing shrub, with leaves silvery beneath and green above, growing on the Likiang Snow Range at an altitude of 13,000 feet. The orange-red berries have a sweet subacid flavor and attractive color."

55787. RUBUS sp.

"(Likiang. July 20, 1922.) Seeds of a shrub 5 to 6 feet high, collected on the slopes of the Likiang Snow Range at an altitude of 13,000 feet. The small leaves are green on both sides, and the scarlet berries are sweet and very palatable."

55788. RUBUS GLAUCUS Benth. Rosaceæ. **Andes berry.**

From Guatemala. Seeds presented by B. M. Young, Morgan City, La. Received September 25, 1922.

"The Andes berry occurs as a wild plant from Mexico to Ecuador. It is a vigorous raspberrylike plant, bearing maroon-colored fruits which resemble Logan blackberries in flavor, but are sweeter. It can probably be culti-

vated on the Pacific coast and in the Gulf States. A full description of the plant, its cultivation, and uses may be found in the Journal of Heredity, vol. 12, pp. 387–393, November, 1921." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 52734.

55789. RHEUM RHAPONTICUM L. Polygonaceæ. **Rhubarb.**

From Ottawa, Canada. Crowns presented by Prof. T. F. Ritchie, Department of Horticulture, Central Experimental Farm. Received September 28, 1922.

"A new variety of rhubarb of very fine quality; it has a slender purplish stalk." (*W. A. Orton.*)

55790. CALLIANDRA TERGEMINA (L.) Benth. Mimosaceæ.

From Dominica, British West Indies. Seeds presented by Joseph Jones, curator, Botanic Gardens, Dominica. Received September 22, 1922.

"Seeds of a small native tree known locally as *bois ravine;* it makes a good hedge plant and is very pleasing when in flower. (*Jones.*)

A beautiful leguminous shrub of the habit of the mimosas, but thornless, with compound leaves composed of six leaflets arranged characteristically in two groups of three each. The long purple filaments of the dense axillary flower heads make this shrub a very pleasing ornamental. (Adapted from *Plumier, Plantarum Americanarum, ed. Burmann, pl. 10.*)

55791. OSYRIS ALBA L. Santalaceæ.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received September 23, 1922.

"This is a small evergreen bush which is very ornamental when loaded with its red fruits. It grows in very dry poor soil." (*Proschowsky.*)

A small upright shrub 3 feet high, widely distributed throughout the Mediterranean region. It has stiff, narrow, yellowish green leaves, small axillary greenish yellow flowers, and small red fruits. The roots and fruit possess astringent properties. (Adapted from *Schneider, Illustriertes Handbuch der Laubholzkunde, vol. 1, p. 247.*)

55792 to 55795.

From Freetown, Sierra Leone, West Africa. Seeds presented by Prof. William N. Martin, Albert Academy, Freetown. Received September 25, 1922.

55792. CUCUMEROPSIS MANNII Naud. Cucurbitaceæ. **Kiffy.**

A cucurbitaceous yellow-flowered climbing vine from tropical Africa.

"The gourdlike fruits, about the size and shape of a goose egg, are produced on vines like that of the ordinary gourd. The seeds when parched and ground produce a delicious condiment, and kiffy seed is an important ingredient in the popular Liberian dish called dumboy. The flavor of the parched seed is similar to that of the parched seeds of *Sesamum indicum*, which are used in the same manner by the natives of Liberia. The seeds are obtained by macerating the fruits in water and washing them free from the pulp. This plant probably would mature its fruits only in the extreme southern United States." (*G. N. Collins.*)

For previous introduction, see S. P. I. No. 31365.

55793 and 55794. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

55793. *Cush Cush.* Seeds yellow.

55794. *Cush Cush.* Seeds red.

55795. ORYZA SATIVA L. Poaceæ. **Rice.**

"Temne rice, the sweetest in Sierra Leone." (*Martin.*)

55796. GUILIELMA UTILIS Oerst. Phœnicaceæ. **Pejibaye.**
(*Bactris utilis* Benth. and Hook.)

From San Jose, Costa Rica. Plants purchased through Oton Jimenez. Received September 15, 1922.

A shipment of plants of the pejibaye. For an extended account of this interesting food palm, see the Journal of Heredity, vol. 12, pp. 154-166, April, 1921.

For previous introduction and description, see S. P. I. No. 54776.

55797 to 55804.

From Harbin, Manchuria. Seeds presented by G. C. Hanson, American consul, Harbin. Received September 25, 1922. Quoted notes by Mr. Hanson.

"The following collection of farm products grown in the Provinces of Heilungchiang and Kirin, Manchuria, was prepared for a world's farm exhibit to be held in Lagrange, Ind., in October, 1922. The seeds are all of the 1921–22 crop."

55797. CANNABIS SATIVA L. Moraceæ. **Hemp.**

"A variety of hemp grown at Anda."

For previous introduction, see S. P. I. No. 44712.

55798. FAGOPYRUM VULGARE Hill. Polygonaceæ. **Buckwheat.**
(*F. esculentum* Moench.)

"Buckwheat from Anda."

55799. HOLCUS SORGHUM L. Poaceæ. **Sorghum.**
(*Sorghum vulgare* Pers.)

"Kaoliang from Tzitzikar."

55800. LINUM USITATISSIMUM L. Linaceæ. **Flax.**

"Siberian linseed from the Ussurisk Railway district."

55801. PANICUM MILIACEUM L. Poaceæ. **Proso.**

"Red millet from Tzitzikar."

55802. SOJA MAX (L.) Piper. Fabaceæ. **Soy bean.**
(*Glycine hispida* Maxim.)

"North Manchurian soy beans; average quality from the River Sungari district."

55803. TRITICUM AESTIVUM L. Poaceæ. **Common wheat.**
(*T. vulgare* Vill.)

"Manchurian wheat; 124/125 Zolotnika natural weight; from Anda."

55804. ZEA MAYS L. Poaceæ. **Corn.**

"A yellow variety of maize from Anda."

55805. PYRUS SEROTINA × COMMUNIS. Malaceæ. **Van Fleet pear.**

Trees grown at the Plant Introduction Garden, Chico, Calif., under P. I. G. No. 6583. Numbered September, 1922.

"A hybrid pear raised by the late Dr. Walter Van Fleet at Little Silver, N. J., and presented to the Plant Introduction Garden in 1909. Promising as a blight-resistant cooking and preserving pear for sections where fire-blight is destructive.

"Origin, Little Silver, N. J. A hybrid probably between Golden Russet, an oriental pear, and one or more of the *communis* types. Medium to large, roundish, obovate; skin golden, covered with numerous small round dots; stalk long, stout; cavity around stalk quite shallow or none at all; basin at the calyx end more or less abrupt, deep, russet; flesh whitish, sweet, slightly subacid, granular; core medium; seeds few, large; not gritty.

"A handsome golden colored pear which when properly ripened makes a fine baking and preserving fruit. The trees are strong and vigorous with large,

thick, glossy leaves. The two original trees have been grown at Chico for more than 10 years and no trace of blight has appeared. J. E. Morrow, superintendent of the Chico garden, who has watched this pear carefully for a number of years, says that it is a splendid cooking pear and that after being cooked it tastes something like pineapple. He further says that, owing to its extreme vigor, size, hardiness, immunity to blight, and heavy cropping qualities, he believes the pear has much promise. He regards it as much better than Kieffer or LeConte and is of the opinion that it should be thoroughly tested, especially in the Southern States." (*B. T. Galloway.*)

For an illustration of this fruit, see Plate V.

55806. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Sydney, New South Wales. Seeds presented by George Valder, Department of Agriculture. Received September 29, 1922.

Locally grown timothy introduced for comparison and cultural experiments.

For previous introduction, see S. P. I. No. 55480.

55807. GUILIELMA UTILIS Oerst. Phœnicaceæ. **Pejibaye.**
(*Bactris utilis* Benth. and Hook.)

From San Jose, Costa Rica. Seeds collected by Edward Goucher, Plant Propagator, Bureau of Plant Industry. Received September 19, 1922.

For previous introduction and description, see S. P. I. No. 55796.

55808 to 55811.

From Buitenzorg, Java. Seeds presented through Carl Hartley. Received September 23, 1922. Quoted notes by Mr. Hartley.

55808 to 55810. ARACHIS HYPOGAEA L. Fabaceæ. **Peanut.**

Presented by the Java Department of Agriculture.

"All of these peanuts mature in 100 days, or, according to the natives, in three months."

55808. "(No. 24 M.) *Broel.* This is a dominantly 3-seeded red-skinned peanut from East Java. It is moderately wilt resistant."

55809. "(No. 74.) *Paarse Holle.* This variety is named for its dark-red seed skin. It is mostly two seeded with some 3-seeded pods and is moderately wilt resistant."

55810. "(No. 71.) *Toeban.* This is grown by the Selectietuin here as their most productive strain. Unlike some of the kinds named 'Toeban' in other places, it has a white seed skin. Of the early-maturing strains, with one exception, it is the most resistant to the locally prevalent wilt, *Bacterium solanacearum.* It is of the bunch type, easily handled and harvested.

55811. CASTANOPSIS ARGENTEA (Blume) A. DC. Fagaceæ. **Chestnut.**

"(April, 1922.) An edible chestnut obtained from the head forester at Palembang, Sumatra."

An evergreen tree 50 to 60 feet high, with narrow, thin leaves 5 to 7 inches long, and very spiny dense clusters of burs; each bur is about 2 inches wide and contains normally a single nut an inch in diameter. (Adapted from *Hooker, Flora of British India, vol. 5, p. 621.*)

For previous introduction, see S. P. I. No. 52533.

55812. MANGIFERA ALTISSIMA Blanco. Anacardiaceæ.

From Manila, Philippine Islands. Budwood presented by Sr. Adn. Hernandez, director, Bureau of Agriculture. Received September 6, 1922.

A Philippine relative of the mango, which is found wild from northern Luzon to southern Mindanao, where it forms a large tree, sometimes reaching a height of 116 feet. The tree is not cultivated, although the mangolike, smooth, green or yellowish fruits, 2 to 3 inches long, are used for making pickles. The

leaves are long, narrow, and pointed at both ends, and the small, fragrant, white flowers are borne in large numbers in branched clusters. (Adapted from *W. H. Brown, Wild Food Plants of the Philippines, p. 94.*)

55813. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

From the Plant Introduction Garden, Chico, Calif. A sucker from the stock plant on which was budded *Amygdalus tangutica*, S. P. I. No. 41709. Numbered September, 1922, for convenience in distribution.

"This tree has matured a very good crop of exceptionally fine freestone peaches. The fruit is yellow with red cheeks, in shape slightly flattened at the ends and bulging in the center, in size about 3 inches in diameter and 2¾ inches long. The basin is wide and shallow, the suture rather indistinct. The flesh is yellow, very juicy, of extra fine quality, and very red at the pit, which is rather large, rough, and deeply corrugated. Average weight about 6½ ounces. A number of persons who have sampled this peach have pronounced it superb. It compares favorably with *Late Crawford* and is about a week later than *Elberta*. It is not as coarse in texture as the latter." (*J. E. Morrow.*)

INDEX OF COMMON AND SCIENTIFIC NAMES.

Acanthosicyos horrida, 55763.
Acer campbellii, 55669.
Alder, *Alnus nepalensis*, 55670.
Aleurites montana, 55647–55650.
Alfalfa, *Medicago sativa*, 55569–55571, 55586, 55646, 55724.
Alnus nepalensis, 55670.
Amygdalus persica, 55739–55742, 55775, 55776, 55813.
Andes berry, *Rubus glaucus*, 55788.
Annona diversifolia, 55709.
Apricot, *Prunus armeniaca*, 55725, 55729.
 Japanese, *Prunus mume*, 55633–55645.
Arachis hypogaea, 55808–55810.
Arisaema sp., 55777.
Averrhoa carambola, 55651, 55652.
Avocado, *Persea americana:*
 Itzamna, 55736.
 Wilder, 55625.

Bactris utilis. See *Guilielma utilis*.
Bamboo, *Cephalostachyum capitatum*, 55676.
 Phyllostachys spp., 55582, 55583, 55713.
Banana, *Musa* spp., 55592, 55593.
Barberry. See *Berberis* spp.
Barley, Trabut, *Hordeum vulgare pallidum*, 55714.
Bean, mung, *Phaseolus aureus*, 55573, 55574.
 soy, *Soja max*, 55802.
Berberis dictyophylla, 55718.
 insignis, 55671.
 napaulensis, 55672.
 wallichiana, 55673.
Blackberry, *Rubus* sp., 55755.
Bowenia spectabilis, 55607.
Bucklandia populnea, 55674.
Buckwheat, *Fagopyrum vulgare*, 55798.
Buddleia colvilei, 55675.
Calamus sp., 55653.
Calliandra tergemina, 55790.
Callitris whytei, 55602.
Cannabis sativa, 55797.
Capulin, *Prunus serotina*, 55764, 55765.
Caragana pygmaea, 55769.
Carambola, *Averrhoa carambola*, 55651, 55652.
Carica papaya, 55733.
Carob, Améle, *Ceratonia siliqua*, 55727.
Cassia laevigata, 55599.
Castanopsis sp., 55654.
 argentea, 55811.
Cephalostachyum capitatum, 55676.
Ceratonia siliqua, 55727.
Chaenomeles sp., 55655.
Cherry, *Prunus* spp., 55720, 55737, 55758, 55782. *P. majestica*, 55732.
 bush, *P. tomentosa*, 55781.
 P. tomentosa endotricha, 55608.
 Japanese flowering, *P. serrulata*, 55587.
 P. serrulata pubescens, 55715.
 P. serrulata spontanea, 55717.
 laurel, *Laurocerasus acuminata*, 55685.
 Sargent's, *P. serrulata sachalinensis*, 55716.
Chestnut, *Castanopsis argentea*, 55811.
Chica, *Pterocarpus* sp., 55708.
Citrus sp., 55624.
 australasica. See *Microcitrus australasica*.
 sinensis, 55743.
Claucena lansium, 55598.
 wampi. See *C. lansium*.
Clematis grewiaeflora, 55677.
Clover, red, *Trifolium pratense*, 55722.
 subterranean, *T. subterraneum*, 55707.
 white, *T. repens*, 55572.

Coix lacryma-jobi, 55656.
Colocasia esculenta, 55617, 55657, 55658.
Combretum sp., 55626.
Corn, *Zea mays*, 55804.
Cracca candida, 55678.
Cucumber, *Cucumis sativus:*
Mammoth, 55767.
Harrison's Giant, 55768.
Cucumeropsis mannii, 55792.
Cucumis melo, 55766.
sativus, 55767, 55768.
Curcuma zedoaria, 55632.
Cyrtostachys lakka, 55579.

Datura leichhardtii, 55622.
Dioscorea alata, 55594–55597, 55712.
Diospyros spp., 55627, 55662.
kaki, 55659, 55660.
lotus, 55661.
Dock, curly, *Rumex crispus*, 55606.

Elaeagnus multiflora, 55771, 55772.
Eriobotrya hookeriana, 55679.
Erythrina arborescens, 55680.

Fagopyrum esculentum. See *F. vulgare*.
vulgare, 55798.
Ficus sp. 55628.
Fig, *Ficus* sp., 55628.
Flax, *Linum usitatissimum*, 55800.
Fortunella spp., 55580, 55581.
Fragaria sp., 55589.
roseiflora, 55726.

Garcinia mangostana, 55728, 55762.
Glycine hispida. See *Soja max*.
Grass, *Paspalum conjugatum*, 55693.
Saccharum arundinaceum, 55667.
spontaneum, 55668.
Guarana, *Paullinia cupana*, 55738.
Guilielma utilis, 55796, 55807.
Gumi, *Elaeagnus multiflora*, 55771, 55772.

Hardenbergia monophylla. See *Kennedia monophylla*.
Hemp, *Cannabis sativa*, 55797.
Holcus sorghum, 55793, 55794, 55799.
Holly, *Ilex insignis*, 55682.
Hordeum vulgare pallidum, 55714.
Hydrangea robusta, 55681.
Hypericum canariense, 55754.

Ilama, *Annona diversifolia*, 55709.
Ilex insignis, 55682.
paraguariensis, 55621.
Indigo. See *Indigofera* spp.
Indigofera australis, 55600.
dosua tomentosa, 55683, 55748.

Jasmine, *Jasminum dispermum*, 55684.
Jasminum dispermum, 55684.
Job's-tears, *Coix lacryma-jobi*, 55656.

Kaki, *Diospyros kaki*, 55659, 55660.
Kennedia monophylla, 55601.
Kiffy, *Cucumeropsis mannii*, 55792.
Kumquat, *Fortunella* spp., 55580. 55581.

Laurocerasus acuminata, 55685.
Leycesteria belliana, 55686.
Ligustrum confusum, 55687.
Lilium spp., 55610, 55730, 55751, 55752, 55756, 55770, 55778–55780.
sutchuenense, 55609.
Lily. See *Lilium* spp.
Lime, finger, *Microcitrus australasica*, 55588.
Linum usitatissimum, 55800.
Lotus uliginosus, 55710.
Lycopersicon esculentum, 55575–55578, 55590, 55591.

Magnolia campbellii, 55688, 55723.
Malus sieboldii, 55744.
Mangifera altissima, 55812.
Mangosteen. *Garcinia mangostana*, 55728, 55762.
Maple. *Acer campbellii*, 55669.
Matiliscuate, *Tabebuia pentaphylla*, 55737.
Medicago sativa, 55569–55571, 55586, 55646, 55724.
Michelia cathcartii, 55689.
excelsa, 55690.
lanuginosa, 55691.
Microcitrus australasica, 55588.
Millettia dielsiana, 55663.
Mimosa rubicaulis, 55749.
Morus laevigata, 55692.
Mulberry, *Morus laevigata*, 55692.
Mu-oil tree. *Aleurites montana*, 55647–55650.

Musa spp., 55592, 55593.
Muskmelon, *Cucumis melo*, 55766.
Myrica rubra, 55735.

Nageia cupressina, 55664.
Narras, *Acanthosicyos horrida*, 55763.
Nicotiana sylvestris, 55750.
Nikau, *Rhopalostylis sapida*, 55619.

Oca, *Oxalis tuberosa*, 55585.
Orange, Groverly Navel, *Citrus sinensis*, 55743.
Oryza sativa, 55731, 55795.
Osyris alba, 55791.
Oxalis tuberosa, 55585.

Palm, *Cyrtostachys lakka*, 55579.
Phoenix spp., 55611–55615, 55665.
Rhopalostylis sapida, 55619.
Trachycarpus martianus, 55706.
Pandanus tectorius, 55629.
Panicum miliaceum, 55801.
Papaya, *Carica papaya*, 55733.
Paspalum conjugatum, 55693.
Paullinia cupana, 55738.
Pea tree, dwarf, *Caragana pygmaea*, 55769.
Peach, *Amygdalus persica*, 55775, 55776, 55813.
Kings Seedling, 55739.
Sunrise, 55470.
Watts Early, 55741.
White Cling, 55742.
Peanut, *Arachis hypogaea*:
Broel, 55808.
Paarse Holle, 55809.
Toeban, 55810.
Pear, Van Fleet, *Pyrus serotina* × *communis*, 55805.
Pejibaye, *Guilielma utilis*, 55796, 55807.
Persea americana, 55625, 55736.
gratissima. See *P. americana*.
Persimmon, *Diospyros* spp., 55627, 55662.
Phaseolus aureus, 55573, 55574.
Phleum pratense, 55603, 55604, 55616, 55623, 55734, 55806.
Phoenix spp., 55611–55615, 55665.
Phyllostachys spp., 55582, 55583, 55713.
Picea morinda. See *P. smithiana*.
smithiana, 55694.
Pieris formosa, 55695.
Plum, *Prunus* spp., 55759–55761, 55783, 55784.
hybrid, *Prunus salicina* × *cerasifera*:
Ford's Early, 55745, 55746.
Norris Early, 55747.
Podocarpus javanicus. See *Nageia cupressina*, 55664.
Prinsepia sinensis, 55711.
utilis, 55719.
Proso, *Panicum miliaceum*, 55801.
Prunus spp., 55720, 55757–55761, 55782–55784.
acuminata. See *Laurocerasus acuminata*.
armeniaca, 55725, 55729.
majestica, 55732.
mume, 55633–55645.
napaulensis, 55696.
persica. See *Amygdalus persica*.
salicina × *cerasifera*, 55745–55747.
sargentii. See *P. serrulata sachalinensis*.
serotina, 55764, 55765.
serrulata, 55587.
pubescens, 55715.
sachalinensis, 55716.
spontanea, 55717.
tomentosa, 55781.
endotricha, 55608.
Pterocarpus sp., 55708.
Puriri, *Vitex lucens*, 55620.
Pyrus serotina × *communis*, 55805.

Raspberry, *Rubus* spp., 55785–55787.
Rattan, *Calamus* sp., 55653.
Rheum rhaponticum, 55789.
Rhododendron arboreum, 55697.
ciliatum, 55698.
dalhousiae, 55699.
falconeri, 55700.
maddeni, 55701.
Rhopalostylis sapida, 55619.
Rhubarb, *Rheum rhaponticum*, 55789.
Rice, *Oryza sativa*, 55731, 55795.
wild, *Zizania* sp., 55584.
Rosa sp., 55721.
Rose, *Rosa* sp., 55721.

Rubus spp., 55630, 55631, 55755, 55785–55787.
fimbriiferus, 55666.
glaucus, 55788.
incisus, 55773.
microphyllus, 55774.
palmatus. See *R. microphyllus*.
Rumex acetosa, 55605.
crispus, 55606.

Saccharum arundinaceum, 55667.
spontaneum, 55668.
Saurauja fasciculata, 55702.
napaulensis, 55703.
Skimmia laureola, 55704.
Soja max, 55802.
Sorghum. *Holcus sorghum*, 55793 55794, 55799.
Sorghum vulgare. See *Holcus sorghum*.
Sorrel, *Rumex acetosa*, 55605.
Spiraea micrantha, 55705.
Spruce, *Picea smithiana*, 55694.
Strawberry, *Fragaria* sp., 55589.
Fragaria roseiflora, 55726.

Tabebuia pentaphylla, 55737.
Taro, *Colocasia esculenta*, 55617, 55657, 55658.
Tephrosia candida. See *Cracca candida*.
Timothy, *Phleum pratense*, 55603 55604, 55616, 55623, 55734, 55806.
Tobacco, *Nicotiana sylvestris*, 55750.
Tomato. *Lycopersicon esculentum*, 55575–55578, 55590, 55591.
Trachycarpus martianus, 55706.
Trifolium pratense, 55722.
repens, 55572.
subterraneum, 55707.
Triticum aestivum, 55803.
vulgare. See *T. aestivum*.

Undetermined, 55753.

Vitex lucens, 55620.

Wampi, *Claucena lansium*, 55598.
Wheat, common, *Triticum aestivum*, 55803.
Widdringtonia whytei. See *Callitris whytei*.

Xanthosoma sp., 55618.

Yam, greater, *Dioscorea alata*, 55594–55597, 55712.
Barbados Red, 55712.
Frances, 55595.
Kohl-E-Patta, 55596.
Morado, 55597.
Pelua, 55594.
Yang mae, *Myrica rubra*, 55735.
Yautia, *Xanthosoma* sp., 55618.
Yerba maté, *Ilex paraguariensis*, 55621.

Zea mays, 55804.
Zizania sp., 55584.

Issued October, 1924

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY

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OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM OCTOBER 1 TO DECEMBER 31, 1922

(No. 73; Nos. 55814 to 56144)



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CONTENTS

	Page.
Introductory statement	1
Inventory	5
Index of common and scientific names	43

ILLUSTRATIONS

	Page.
PLATE I. A handsome Chinese primrose. (*Primula sinopurpurea* Balf. f.; S. P. I. No. 55899)	14
II. A drought-resistant Asiatic plum. (*Prunus* sp.; S. P. I. No. 55901)	14
III. A showy alpine plant from western China. (*Incarvillea grandiflora brevipes* Sprague; S. P. I. No. 55934)	20
IV. A chestnut from the mountains of southwestern China. (*Castanea* sp.; S. P. I. No. 56080)	20

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INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM OCTOBER 1 TO DECEMBER 31, 1922 (NO. 73; NOS. 55814 TO 56144)

INTRODUCTORY STATEMENT

To many it may not be apparent why the Province of Yunnan, which borders Tibet on China's western boundary, is a particularly likely place to search for plants for introduction into America.

Mr. Rock, our agricultural explorer, who has been collecting in this region now for nearly three years, shows by his notes and specimens in what way Yunnan plants are likely to be valuable to American horticulture.

The vast mountain area, in which he has been exploring, where snow-clad peaks 12,000 to 20,000 feet high rise from almost subtropical valleys and gorges thousands of feet deep have been channeled by the largest and longest rivers in Asia (the Mekong and the Yangtze) in their break through the mountains which bound the Tibetan table-land, furnishes a home for thousands of interesting plants which some day will enrich our horticulture.

It is true that other exploring botanists, like Forrest and Kingdon Ward, have visited it, but this is the first time that an American explorer, with the needs of our farms and gardens in mind, has hunted for plants which can be grown in American dooryards and has entered western China by its back door, so to speak, which is Bhamo, on the border of Burma.

Mr. Rock's itinerary, like that of Frank Meyer, will be given in detail in a later number of this series. It suffices for him to locate the region where he collected the plants in this inventory. This centers chiefly around Likiang and the Likiang Snow Range. Many of the plants were found in localities where the thermometer goes below 32° F. and heavy snowfalls occur. High tropical altitudes and temperate-region latitudes correspond, but only roughly so, for it has come to be well recognized that high alpine plants are accommodated to conditions which do not prevail at many places at sea level in the Temperate Zone. The heavy and continuous blanket of snow which characterizes many mountain regions makes it possible for many rather tender plants, such as the potato, for example, to live in the ground over winter. To illustrate, in the higher altitudes of the Rockies on its western slopes and also as far north as Cape Breton Island, Nova Scotia, potato tubers often remain unfrozen in the soil because the soil is blanketed with snow before freezing weather occurs, whereas otherwise they would be frozen in

the ground nearly every year as far south as the Carolinas. Then, too, there must be taken into consideration the length of day, the atmospheric pressure which affects the amount of oxygen and carbon dioxid in the air, and the effect which high mountain atmosphere has upon the actinic rays of the sun. In other words, it should never be forgotten that these plants are essentially cosmic machines run by the sun's energy and that in no two places on the globe do identical atmospheric conditions prevail.

Twenty-five years of experience has taught those of us who have been establishing new plants in America to be very cautious in predicting where plants will thrive, for no one can foresee except in a general way the degree of accommodation which any new plant will exhibit. The only way to find out is to test it, and Mr. Rock has sent in large quantities of seeds for trial.

Exploring alone in any country has its shady side, but in Yunnan, where the explorer may at any time meet bands of roving bandits and be subjected to the barbarities which only savages know how to inflict, Mr. Rock has had to meet conditions which have been almost unbearable.

This fact should be borne in mind by those to whom in the years to come these plants are sent for trial, and their value should be measured in terms of the dangers and hardships which they have occasioned. That Mr. Rock has been able to hold out and keep moving to America a stream of seeds and cuttings is the wonder of his friends.

One of the reasons for Mr. Rock's expedition to Yunnan was to discover what species of chestnuts grow there and secure their seeds. In this quest he has been successful.

On the summit of the Salwin Ridge, southwestern Yunnan, Mr. Rock found dense forests of a large species of chestnut (*Castanea* sp.: No. 56080) which grows to be 100 feet tall and 5 feet in diameter and bears sweet edible nuts the size of chinquapins. It is an excellent timber tree, ratoons freely from the stump, and no evidence of any disease was found upon it. Four days' journey west of Talifu he found a small forest species, only 60 feet tall (*Castanea* sp.: No. 56119), also with small nuts; and a tall species near Tali Lake which bore deliciously sweet nuts (*Castanea* sp.; No. 55984). Whether out of these species or others which he has collected will come one which will solve the chestnut problem is a question which will require years to answer. At any rate the first step—that of getting together the Asiatic chestnuts—has been taken.

From the discovery by Mr. Rock of numerous distinct species of wild apples growing in the mountains far removed from civilization, it would appear that western Yunnan is the region from which to get southern forms of this fruit with which to build up by hybridization an apple for our Southern States which now lie below the apple belt. This collection includes fruits varying from the size of cherries to those of large-sized crab apples. Some are trees 40 feet high, growing in hot, dry, rocky locations where little else besides the Yunnan pine grows, and others have long drooping branches. None of these has as yet been determined botanically.

Wild as well as cultivated peaches also occur in western Yunnan, and Mr. Rock reports there a clingstone white-fleshed peach

(*Amygdalus persica;* No. 55929) 3½ to 4 inches in diameter, which he found growing wild in the Likiang Valley, and other trees 40 to 50 feet tall with fruits tasting like cherries (Nos. 55885 and 55888).

Among the numerous wild species of Prunus are plums with fruits the size of walnuts (*Prunus* sp.: No. 55824), a lemon-yellow form from regions subjected to extreme drought and intense heat from October to June (No. 55901), and small-fruited forms, from 12,000 feet altitude on the slopes of Satseto in pure limestone soils, which may prove of value for stocks.

Mr. Rock has collected species of Rubus bearing delicious orange-red berries from 12,000 to 13,000 feet altitude (Nos. 55891, 55892, and 55904) and others from the shade of the spruce forest with fruits orange-red and translucent and an inch in diameter (No. 55892), crimson-stemmed drooping-branched ornamental forms (No. 55893), and still others which are spineless (No. 56114).

Mr. Rock has sent in a wild grape (*Vitis* sp.: No. 55953) which he found covering rosebushes there. It is a prolific bearer and its dull-purple berries are very sweet, which is not usually the case with wild species of Vitis. He has sent nuts from a wild walnut tree 50 feet tall and with a spread of branches of 100 feet (*Juglans regia;* No. 55989); a tree hazelnut (*Corylus* sp.: No. 55987) which grows to be 60 to 80 feet tall and has handsome, very large leaves and large edible nuts; various as yet unidentified species of persimmon (*Diospyros* spp.: Nos. 56132 to 56134); the rare *Catalpa duclouxii* (No. 55931) which makes a tree 70 to 80 feet tall and 4 feet in diameter and produces hard durable timber suitable for building purposes that may contribute to the development of a superior hybrid catalpa for forest purposes. In the way of ornamental shrubs, lilies, and other ornamental plants the region has already become noted in England. Mr. Rock has sent seeds of a honeysuckle (*Lonicera* sp.: No. 55897); the rare *Osteomeles schwerinae* (No. 55992) with its dull-purple fruits which are sweet and edible; gorgeous primroses (*Primula* spp.); an edible-fruited viburnum (*Viburnum* sp.; No. 55950); an ornamental currant (*Ribes* sp.; No. 55890); the wild peony (*Paeonia delavayi;* Nos. 55898, 55937, 55994); and a striking new ornamental tree (*Cornus* sp.: No. 55955).

In addition to Mr. Rock's collections there have been received from various correspondents throughout the world a wild plum from Beirut (*Prunus ursina;* No. 55872) for trial as a stock in southern California; Goodman's Choice peach (*Amygdalus persica;* No. 55831), a great success in Australia, which if it succeeds in America as it has there might easily add millions to the California peach-canning industry; a new mango (*Mangifera indica;* No. 55839) from Gerrit P. Wilder, of Honolulu, which turns yellow while hard and keeps well for two weeks; 39 varieties of beardless spring wheat (*Triticum aestivum;* Nos. 55842 to 55870) originated by two noted plant breeders of New South Wales, J. P. Shelton and J. T. Pridham, of Sydney. Some of these varieties are said to produce better flour than the noted Hard Federation wheat, which is also of Australian origin.

Dr. P. J. S. Cramer, of the Java Department of Agriculture, presents two interesting varieties of sugar cane (*Saccharum officinarum;* Nos. 55829 and 55830) from the Sugar Experiment Sta-

tion at Pasoeroean, Java, one of which instead of producing sugar produces only starch in its stems and one whose flower heads are so hypertrophied as to be used as a vegetable by the Javanese.

The botanical determinations of seeds introduced have been made and the nomenclature determined by H. C. Skeels, and the descriptive notes have been prepared by Paul Russell, who has had general supervision of this inventory.

DAVID FAIRCHILD,
Agricultural Explorer in Charge.

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION,
Washington, D. C., December 21, 1923.

INVENTORY[1]

55814. Olea europaea L. Oleaceæ. Olive.

From Nice, France. Cuttings presented by Dr. A. Robertson Proschowsky. Received November 25, 1922.

Variety *Arbéquina*. This is a favorite among the Catalan nurserymen in the Province of Lerida, Spain, where it represents 92 per cent of the olives planted. It appears to be the one most resistant to the rather frequent drops in temperature on the Urgel Plain. The production is very high in the irrigated sections every year and every two years in the other sections. In habit the tree is spreading, with the secondary branches reflexed. In this region the olive trees are pruned every two years and often every year, with a special rejuvenating pruning every 10 or 12 years, in order to keep down the size of the trees and make easier the hand picking of the fruit. (Adapted from *Revue de Botanique Appliquée, vol. 2, p. 26.*)

55815. Dendrocalamus sikkimensis Gamble. Poaceæ. Bamboo.

From Darjiling, India. Seeds presented by G. H. Cave, curator, Lloyd Botanic Garden. Received November 1, 1922.

"Seeds of the largest bamboo of these forests, collected at an altitude of 2,000 feet." (*Cave.*)

A beautiful tufted bamboo native to Sikkim, India, where the dark-green culms reach a height of 60 feet or more and a diameter of 5 to 7 inches. The species is easily distinguished by its large reddish brown globular flower heads and densely velvety stem sheath. The long narrow leaves are said to be poisonous, and from the stems are made the "chungas," or native buckets, used for carrying water and milk and for churning. (Adapted from *Annals of the Royal Botanic Garden, Calcutta, vol. 7, p. 82.*)

For previous introduction, see S. P. I. No. 54450.

55816. Voandzeia subterranea (L.) Thouars. Fabaceæ.

From Ebolowa, Cameroon, West Africa. Seeds presented by Fred Hope. Received November 2, 1922.

A creeping annual leguminous plant which matures its fruits in the same manner as the peanut, whence its common name "groundnut." It is native to tropical Africa and is extensively grown in that continent, as well as in other tropical countries, for its edible seeds.

For previous introduction, see S. P. I. No. 55104.

55817 to 55819.

From Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received October 4, 1922. Quoted notes by Mr. Rock.

[1] It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in this inventory are those under which the material was received when introduced by the Office of Foreign Seed and Plant Introduction and, further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in this inventory will be subject to change with a view to bringing the forms of the names into harmony with recognized American codes of nomenclature.

55817 to 55819—Continued.

55817. MALUS sp. Malaceæ. **Apple.**

"(Likiang. July, 1922.) A tree 40 feet high, found wild and semicultivated in the vicinity of Likiang. The handsome fruits, about 2 inches in diameter, are bright crimson with just a touch of yellow. The flesh is firm, not mealy, with an acid-sweet flavor. A delicious bright-red jelly is made by boiling the fruits whole, in the skin, 2 parts of apples to 1 part of water; the juice is strained and boiled with sugar, 3 parts of sugar to 5 parts of juice."

55818. PRUNUS sp. Amygdalaceæ. **Plum.**

"(Near Szemao. July, 1922.) A large tree, 40 feet or more in height, collected 30 li (9 miles) from Szemao, at 5,000 feet altitude. The red fruits are the size of walnuts, with loose, rather sour flesh. This should be good as a stock plant."

55819. PRUNUS sp. Amygdalaceæ. **Plum.**

"(Near Szemao. July, 1922.) A large tree 45 feet high, found in the mountains at an altitude of 6,000 feet. The dark-red fruits, the size of large walnuts, have hard flesh with a sour insipid flavor. This tree was free from disease and should make a good stock plant."

55820 to 55826.

From Likiang, Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received October 9, 1922. Quoted notes by Mr. Rock.

55820. COTONEASTER sp. Malaceæ.

"(No. 5749. August, 1922.) A very ornamental shrub 8 to 10 feet high, growing in open scrubland among limestone bowlders at altitudes of 9,000 to 10,000 feet on the Likiang Snow Range. The leaves are densely packed along the stems; the pinkish flowers are numerous, as are also the scarlet and yellow fruits, the latter resembling miniature apples."

55821. COTONEASTER sp. Malaceæ.

"(No. 5781. August, 1922.) A prostrate shrub, growing on pure limestone rocks on the Likiang Snow Range at altitudes of 8,000 to 10,000 feet. It has small dark-green glossy leathery leaves, pinkish white flowers, and rich-red fruits and would make a splendid shrub for rockeries."

55822. PRUNUS sp. Amygdalaceæ. **Cherry.**

"(August, 1922.) A tree 35 to 40 feet high, growing among limestone bowlders at an altitude of 10,000 feet. It is a fine shapely tree, with glossy leathery foliage, racemes of white flowers, and dark-red glossy fruits the size of a pea.

"The temperature at the village of Nguluke, in the Likiang Plain, drops to below zero Fahrenheit in the winter, and a fall of 22 inches of snow in December is not uncommon."

55823. PRUNUS sp. Amygdalaceæ. **Cherry.**

"(August, 1922.) A shapely tree, which grows at an altitude of 10,000 feet among limestone bowlders on the Likiang Snow Range. It has long drooping racemes of cream-colored flowers and small yellowish green fruits which are sour when ripe."

55824. PRUNUS sp. Amygdalaceæ. **Plum.**

"(August, 1922.) A very hardy plum tree 35 to 40 feet high, growing semiwild in the vicinity of Likiang, at altitudes of 8,500 to 9,000 feet. The bright-red, perfectly round fruits are the size of large walnuts, clingstone, with yellow sweetish sour flesh which makes excellent jelly and jam."

55820 to 55826—Continued.

55825. RUBUS BIFLORUS Buch.-Ham. Rosaceæ.

"(July, 1922.) A rambling shrub, collected on the Likiang Snow Range at altitudes of 11,000 to 12,000 feet. The large leaves have woolly lower surfaces, the large calyx is foliaceous, and the subacid yellow fruits are the size of a thimble."

55826. RUBUS sp. Rosaceæ.

"(No. 5359. July, 1922.) A vigorous rambling shrub, collected at an altitude of 12,000 feet on the Likiang Snow Range. It has red spiny stems, leaves with white lower surfaces, pinkish purple flowers, and small dark-red fruits of a delicious sweet flavor."

55827. CASTANEA SATIVA Mill. Fagaceæ. European chestnut.

From Morristown, N. J. Nuts presented by Dr. C. S. Sargent, Arnold Arboretum, Jamaica Plain, Mass. Received October 27, 1922.

From a tree grown on T. H. Symington's place.

Introduced for department specialists engaged in chestnut-breeding experiments.

55828. CUCUMIS SATIVUS L. Cucurbitaceæ. Cucumber.

From Burringbar, New South Wales. Seeds presented by B. Harrison. Received October 11, 1922.

"*Harrison's Long.* A cucumber 2 to 3 feet long, with tender, crisp, and palatable flesh. This variety is the result of careful selection and cultivation." (*Harrison.*)

55829 and 55830. SACCHARUM OFFICINARUM L. Poaceæ. Sugar cane.

From Pasoeroean, Java. Cuttings presented by J. Kuyper, assistant director, Sugar Experiment Station, Pasoeroean, at the request of Dr. P. J. S. Cramer, Director of the General Experiment Station, Buitenzorg. Received October 13, 1922. Quoted notes by Doctor Cramer.

55829. "*Teboe glonggong.* A variety with starch instead of sugar in its stems; this appears to be a botanically interesting variation."

55830. "*Teboe trocbocg.* A variety with hypertrophied flowers, used here as a vegetable."

55831. AMYGDALUS PERSICA L. Amygdalaceæ. Peach.

(*Prunus persica* Stokes.)

From Eastwood, near Sydney, New South Wales. Trees purchased from C. E. Vessey, Mount Tomah Nurseries. Received at the Plant Introduction Garden, Chico, Calif., September, 1922. Numbered October, 1922.

Goodman's Choice.

The following notes concerning the merits of this peach have been received from nurserymen in Australia:

From Herbert J. Rumsey, Dundas, New South Wales, June 13, 1922: "We have sent out a number of letters to friends who are in a position to know the behavior of this peach and its comparison with *Phillips Cling* [at present the standard canning variety in California]. We have had a reply from Mr. Goodman, who states that this is easily the best quality canning peach the canners have ever seen and that growers in that State (Victoria) are putting in more acres of it than of all other yellow clings together.

"His catalog description, quoted below, shows that it ripens about six weeks later than *Tuscan Cling:*

"'Undoubtedly the greatest yellow-fleshed clingstone peach introduced for many years. The tree is a heavy bearer each season of medium-sized fruits that are admirable for canning. The skin has a red blush on the sunny side;

the flesh is beautifully rich and translucent; the variety is remarkable for even crops and gradual ripening, which means so much when the picking campaign is in progress. The peaches ripen toward the end of February and, as the name indicates, represent my choice for canning.'

"We know the behavior of the clings generally in this State, and we find that they have a great tendency to be uneven in shape. Our own nurseryman states that *Goodman's Choice* is one of the best late peaches that he has come across, but as we have no growers for canneries around there we can not give an authoritative report from that point of view ourselves."

From G. W. Peart, manager for C. J. Goodman, Bairnsdale, Victoria, June 14, 1922: "The flesh of this peach is wonderfully rich for canning purposes, and the processed product is just as superior to other varieties in appearance as it is in taste. In quality it is superior to *Phillips Cling*. Canners in this State declare that they can obtain more dozens of high-grade quality canned peaches from a ton of *Goodman's Choice* than from any other variety. This means that canners pay higher prices for *Goodman's Choice*. The variety is a regular cropper and has never failed to set a good crop in 12 years except once when a record late frost ruined all the stone fruits in the district. Unlike *Phillips Cling*, all the fruits on the tree come up to first-class cannery requirements." In another letter, dated June 30, 1922, Mr. Peart says further: "This peach originated about 18 years ago in one of our canning peach orchards at Mossiface, Victoria. After careful testing, the late Charles J. Goodman planted 3,000 trees in 1910, and we commenced to sell trees in 1915. To-day I am selling more trees of this variety than of any other clingstone peach. Z. Akers, Shepparton Fruit Preserving Co., Shepparton, Victoria, has a block of 6-year-old *Goodman's Choice*, and he claims to have harvested an average crop of 3½ bushels of fruit per tree when the trees were just 4 years old."

From E. Meeking, Senior Fruit Inspector, Melbourne, Victoria, June 14, 1922: "The *Goodman's Choice* variety of peach is considered, in the opinion of those competent to judge, the best canning peach which has yet been produced. It is a good cropper, produces uniform fruits, is of excellent color and texture, and its flavor is considered superior to that of any other canning peach yet produced."

From L. J. Wicks, Highbury, South Australia, July 13, 1922: "As a canning fruit *Goodman's Choice* is certainly O. K. The texture is just right; it makes a rather pale sirup which, however, is remarkably clear."

55832 and 55833.

From Buitenzorg, Java. Seeds presented by Carl Hartley. Received October 11, 1922. Quoted notes by Mr. Hartley.

55832. CITRUS NOBILIS DELICIOSA (Ten.) Swingle. Rutaceæ.
Mandarin orange.

"A rather large, very loose-skinned mandarin orange grown in the highlands of western Java under the name *Djeroek Garoet*. The fruits from which these seeds were taken were juicy and of excellent flavor."

55833. RUBUS FRAXINIFOLIUS Poir. Rosaceæ.

"Collected at an altitude of about 3,500 feet on the Salak in western Java. The bush is often 2 meters high and very slightly thorny. The conical strawberry-red fruit, 2.5 centimeters long and 2 centimeters wide at the base, is inclined to be hollow and deficient in pulp, but it is not acid and the flavor is fairly good. The species may prove valuable in breeding work."

For previous introduction, see S. P. I. No. 31096.

55834. DIOSCOREA sp. Dioscoreaceæ. Yam.

From China or Japan. Tuber presented by E. R. Sasscer, Federal Horticultural Board. Secured by an inspector of the California State Department of Agriculture. Received October 2, 1922.

"Tuber long, slender, dark skinned, white fleshed, rather small. When cooked the flesh is firm, but fairly mealy and of very good flavor." (*R. A. Young.*)

55835 and 55836. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**

(*Prunus persica* Stokes.)

From the Plant Introduction Garden, Chico, Calif. Seedling trees numbered October, 1922, for convenience in distribution. Quoted notes by J. E. Morrow.

A shipment of seeds of the peach variety *Tardio Amarillo* was received from southern Spain in November, 1916, and given S. P. I. No. 43570. As is well known, peach varieties do not come true to seed, and the two trees described below are promising seedlings from this shipment.

55835. "Tree No. 6, Test Nursery. Fruits 2⅞ by 2¼ inches; average weight 4 ounces; color golden with a faint-red blush; basin deep and narrow, slight depression at suture; flesh yellow; pit yellow. Season September 5 to September 15, later than last year. This is a good canning clingstone peach and a heavy bearer."

55836. "Tree No. 8, Test Nursery. Fruits 2 by 2⅛ inches; average weight 4 ounces; basin deep, narrow; suture only a thin line; flesh deep yellow; pit small, yellow; flesh of good texture and flavor. This peach should be propagated for canning purposes. It is of smaller size than last season and later in ripening."

55837. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Kelburn, Wellington, New Zealand. Presented by E. Bruce Levy, biology section, Department of Agriculture, New Zealand. Received October 16, 1922.

"This seed, secured directly from the grower, represents a strain of timothy which has been grown in one district for 22 years." (*Levy.*)

Locally grown seed introduced for department specialists engaged in timothy-breeding investigations.

55838. TRIFOLIUM PRATENSE L. Fabaceæ. **Red clover.**

From Glavica, Dalmatia, Yugoslavia. Presented by the Knin Agricultural School, Glavica. Received October 14, 1922.

Seeds consisting of a mixture of "North" and "Composite" varieties, harvested in 1921 in Zetva, and obtained from a seed firm in Laibach, Slovenia, Yugoslavia.

Locally grown red-clover seed introduced for cultural and comparison tests.

55839. MANGIFERA INDICA L. Anacardiaceæ. **Mango.**

From Honolulu, Hawaii. Plant presented by Gerrit P. Wilder, through Willis T. Pope, horticulturist, Hawaii Agricultural Experiment Station. Received October 18, 1922.

"*Wootten.* The original was produced from seed of the mango known as No. 7, originally from Jamaica, and is growing on the property of J. L. Horner, Makiki St., Honolulu.

"A formal description of the fruit is as follows: In size it is medium to large; shape roundish; slightly flattened on the sides, no apex point evident; weight about 10 ounces; color when ripe a shade between orange-yellow and yellow-orange, with tinges of pink and red at the stem end and pale-yellow dots all over the surface; skin medium thin, tough, peeling qualities fair, very pleasing fragrance; flesh rich apricot yellow, very good texture; flavor excellent, juicy, sweet-acid; seed medium to small for size of fruit.

"An important characteristic of this variety is that while still solid it has a very beautiful color as if ripe, making it a very desirable marketing form. It is one of the very best of this seedling class of mangos. In moderate temperatures it will remain in good condition as ripe fruit for two weeks." (*Wilder.*)

55840. ACTINIDIA CHINENSIS Planch. Dilleniaceæ. **Yang-tao.**

Plants raised from seed secured from D. W. Coolidge, Pasadena, Calif. Numbered October, 1922, for convenience in distribution.

Plants of this large-fruited seedling have been propagated at the Plant Introduction Garden at Chico, Calif., under P. I. G. No. 19420 and at Bell, Md., under P. I. G. No. 1846.

"The *yang-tao*, an ornamental deciduous climber native to Szechwan, China, has attracted considerable attention because of the high quality of its fruits. The leaves have a plushlike texture and an unusual dark-green color, and their large size and regular spacing add to the beauty of the vine. The flowers are buff yellow to white, fragrant, often 1½ inches across, and are produced in great abundance. The ovoid to globose russet-brown villous fruits are about 2 inches long. The flesh is green, of most excellent flavor, resembling that of a gooseberry, but tempered with a flavor peculiarly its own. The fruit is good when eaten fresh and also makes very fine jam and sauce." (*David Fairchild.*)

For previous introduction, see S. P. I. No. 54460.

55841. LYCOPERSICON ESCULENTUM Mill. Solanaceæ. **Tomato.**

From Montevideo, Uruguay. Seeds presented by Luis Guillot, Dirección de Paseos Públicos. Received October 18, 1922.

Introduced from tropical America in the hope of securing a strain immune to tomato leaf-spot.

55842 to 55870. TRITICUM AESTIVUM L. Poaceæ. (*T. vulgare* Vill.) **Common wheat.**

From Sydney, New South Wales. Presented by J. P. Shelton, plant breeder, Department of Agriculture, Sydney. Received October 17, 1922. Quoted notes by Mr. Shelton.

"The varieties listed below are all beardless spring wheats, white grained, with medium to strong flour qualities, and all give commercial yields in some districts. Those marked 'strong flour' should give a flour of better bread-making qualities than those marked 'Hard Federation.'"

55842 to 55855. "(A) Varieties lately bred in New South Wales by J. T. Pridham, but not yet in general cultivation."

55842. *Aussie.*

55843. *Baldknob.*

55844. *Early Bird.* (Very early.)

55845. *Forelock.* (Bearded.)

55846. *Ghurka.* (Strong flour. Very early.)

55847. *Riverina.* (Early.)

55848. Selection 13 (C1) from Hard Federation. (Strong flour.)

55849. Selection 19 (C1) from Hard Federation. (Strong flour.)

55850. Selection 69 (A6) from Hard Federation.

55851. *Stamina.* (Strong flour. Early.)

55852. *Wagga* No. 49.

55853. *Wagga* No. 54. (Early.)

55854. *Wandilla.*

55855. *Waratah.* (Early.)

55856 to 55860. "(B) Varieties in general cultivation in New South Wales and Victoria."

55856. *Canberra.* (Very early and prolific.)

For previous introduction, see S. P. I. No. 42109.

55842 to 55870—Continued.

55857. *Gallipoli.*

55858. *Gresley.*

55859. *Improved Steinwedel.*

55860. *Minister.* (Strong flour and late.)

55861 to 55868. "(C) Varieties lately fixed in West Australia; some from crosses made in New South Wales."

55861. *Carrabin.* (Strong flour.)

55862. *Cuballing.*

55863. *Dindiloa.* (Strong flour.)

55864. *Gerralying.* (Strong flour.)

55865. *Merredin.*

55866. *Nabawa.*

55867. *Nangeenan.*

55868. *Narrogin.* (Strong flour.)

55869 and 55870. "(D) Varieties for a hot climate with summer rainfall."

55869. *Boureng.*

55870. *Bunge.*

For previous introduction, see S. P. I. No. 47380.

55871. PEUMUS BOLDUS Molina. Monimiaceæ.

From Santiago, Chile. Seeds presented by Salvador Izquierdo. Received October 13, 1922.

"*Boldo.* A small tree esteemed in Chile for its ornamental and medicinal value. The dried leaves are exported to Europe, where they are employed in diseases of the liver. An infusion of the flowers is also used medicinally. The fruits are eaten but are not of great value.

"The tree is dioecious and very aromatic in all its parts. It has opposite, rough, short-petioled, ovate leaves; the flowers, borne in small axillary racemes, are followed by fruits the size of our northern haws." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 54639.

55872. PRUNUS URSINA Kotschy. Amygdalaceæ. **Plum.**

From Beirut, Syria. Seeds presented by Alfred E. Day, American University of Beirut. Received October 14, 1922.

"A wild plum. The fruits of this particular tree are decidedly larger and sweeter than usual; they are about 1¼ inches in diameter and yellow with pink cheeks." (*Day.*)

55873. COTONEASTER HEBEPHYLLA Diels. Malaceæ.

From Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received October 18, 1922.

"(Likiang, August, 1922.) A deciduous shrub 10 to 18 feet in height, growing in limestone soil at an altitude of 10,000 to 11,000 feet on the Likiang Snow Range. It has long rambling branches, white flowers, and dark-carmine fruits and is quite ornamental." (*Rock.*)

55874 to 55884.

From Petrograd, Russia. Seeds presented by Prof. N. I. Vavilov, director, Russian Bureau of Applied Botany of the Agricultural Scientific Committee, through D. N. Borodin. Received October 19, 1922. Quoted notes by Mr. Borodin.

"The numbers refer to the inventory book of the Russian Bureau of Applied Botany."

55874 to 55877. PISUM ARVENSE L. Fabaceæ. **Field pea.**

55874. "Vavilov's 'Mahor,' No. 193, 1921. From Varg on Goont, Pamir."

55875. "Vavilov's 'Mahor,' No. 194, 1921. From Sengi, Pamir."

55876. "Vavilov's 'Mushung,' No. 190. From Chil-Dare-Darviz, Pamir."

55877. "Vavilov's 'Mushung,' No. 195. From Kooliab, Pamir."

55878 to 55880. PISUM SATIVUM L. Fabaceæ. **Garden pea.**

55878. "Pissarev's B 11, No. 317. From Irkutsk Government, Siberia."

55879. "Pissarev's No. 318. From Ust-Uda, Urkutsk Government, Siberia."

55880. "Pissarev's 'Tulunsky Hybrid,' No. 316. From Tulun, Siberia."

The fact that the following are without ligules is noted as being of interest to botanists, such forms being rare in this country:

55881. SECALE CEREALE L. Poaceæ. **Rye.**

"Vavilov's rye, grown in Russia in 1921. From Pamir."

55882 to 55884. TRITICUM AESTIVUM L. Poaceæ. Common wheat. (*T. vulgare* Vill.)

55882. "Vavilov's wheat, No. 96. From Pamir."

55883. "Vavilov's wheat, No. 648. From Pamir."

55884. "Vavilov's wheat, No. 1569. From Pamir."

55885 to 55893.

From Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received October 21, 1922. Quoted notes by Mr. Rock.

55885 to 55888. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.** (*Prunus persica* Stokes.)

55885. "(Puerhfu, August, 1922.) A large tree growing wild in the mountains at an altitude of 5,000 feet. The fruits are a beautiful red, clingstone, with juicy, rather strong-flavored flesh resembling that of a cherry."

55886. "(Puerhfu, August, 1922.) A large tree 50 feet in height, growing wild in the mountains at an altitude of 5,500 feet. The fruits are of fairly good size, yellow with a red cheek, clingstone, with yellow, very juicy flesh of excellent flavor.

55887. "(Likiang, August, 1922.) A large vigorous tree growing at an altitude of 8,500 feet. The large fruits, 2½ inches in diameter, are red and yellow on the surface, with firm snow-white, quite tasteless flesh. This should be a good stock plant."

55888. "(Puerhfu, August, 1922.) A large tree, 40 to 50 feet high, growing wild in the mountains. The fruits are the size of small apples, pure white outside, clingstone, with snow-white, very juicy flesh resembling that of a cherry.

55885 to 55893—Continued.

55889. MALUS sp. Malaceæ. **Apple.**

"(Likiang. August 15, 1922.) A large vigorous tree growing wild and semicultivated. The fruits, the size of walnuts, are bright crimson with a touch of yellow on one side, with acid-sweet, very palatable flesh, are excellent for jam or jelly and also quite ornamental."

55890. RIBES sp. Grossulariaceæ.

"(No. 5833. Likiang. August 16, 1922.) A shrub 6 to 15 feet in height, growing in alpine meadows at an altitude of 12,000 feet, where it is 5 or 6 feet high; also in fir forests, where it reaches a height of 15 feet. It is a beautiful plant with pendent branches loaded with flowers in early May. In the latter part of August the fruits appear; these are yellowish red berries the size of a pea, with an acid-sweet flavor."

55891 to 55893. RUBUS spp. Rosaceæ. **Raspberry.**

55891. RUBUS sp.

"(Likiang. August 15, 1922.) A shrub 4 feet high, growing in protected gulches on the Likiang Snow Range at an altitude of 12,000 feet. It bears delicious orange-red berries and may be only a form of the following [S. P. I. No. 55892]."

55892. RUBUS sp.

"(Likiang. August 15, 1922.) A shrub 4 feet high, growing on the Likiang Snow Range at an altitude of 13,000 feet in the shade of *Larix thibetica* and also in fir and spruce forests. The large orange-red translucent berries, an inch in diameter, are very juicy and of delicious flavor. This is certainly worthy of cultivation."

55893. RUBUS sp.

"(Likiang. August, 1922.) A shrub growing in sheltered ravines on the Likiang Snow Range at an altitude of 11,000 to 12,000 feet. It has crimson-stemmed drooping branches and trifoliolate leaves, with the lower surfaces slightly pruinose or silvery. The fruits, somewhat smaller than those of the preceding species, are obconical, darker red, and faintly pubescent."

55894 and 55895.

From Hongkong, China. Seeds presented by H. Green, superintendent, Botanical and Forestry Department. Received October 21, 1922.

55894. GARCINIA OBLONGIFOLIA Champ. Clusiaceæ.

A tree native to Hongkong, China, which is a relative of the mangosteen. It has narrow short-stalked leaves, terminal yellow flowers, and smooth fruits the size of a small apple. (Adapted from *Bentham, Flora Hongkongensis, p. 25.*)

"This species has just come into bearing in one of our greenhouses, and we find the fruit to be of very good quality for eating out of hand. The flavor suggests that of the mangosteen." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 36497.

55895. UVARIA CALAMISTRATA Hance. Annonaceæ.

"A native fruit which grows wild here and is erroneously called by the natives 'Hill Lai Chi.'" (*Green.*)

A climbing plant, native to Hongkong, with rather thick oblong leaves, clustered yellowish flowers, and elliptical fruits about a third of an inch in length. (Adapted from *Journal of Botany, vol. 20, p. 77.*)

55896 to 55905.

From Likiang, Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received October 25, 1922. Quoted notes by Mr. Rock.

55896. COTONEASTER PANNOSA Franch. Malaceæ.

"(No. 5818. August 20, 1922.) A very ornamental shrub 10 feet high, growing among limestone bowlders in fir forests and alpine meadows on the Likiang Snow Range at altitudes of 9,000 to 12,000 feet. The flowers are whitish pink and the ovate fruits purplish black."

For previous introduction, see S. P. I. No. 40169.

55897. LONICERA sp. Caprifoliaceæ. **Honeysuckle.**

"(No. 6058. August 25, 1922.) A shrub or small tree 20 feet in height, with a trunk a foot in diameter, which grows in limestone soil in the foothills near Likiang at altitudes of 9,000 to 10,000 feet. The flowers, which appear in early spring, are a deep orange-yellow, with a paler lower lip, and the small round fruits are tomato red."

55898. PÆONIA DELAVAYI Franch. Ranunculaceæ. **Peony.**

"(No. 6059. August 25, 1922.) A very attractive, vigorous shrub 4 feet high, growing on steep slopes among limestone bowlders and in alpine meadows at altitudes of 10,000 to 13,000 feet on the Likiang Snow Range. The deep-crimson flowers are 3 inches in diameter."

55899. PRIMULA SINOPURPUREA Balf. f. Primulaceæ. **Primrose.**

"(No. 5783. August 25, 1922.) A very charming robust plant 3 feet in height, growing in acid soil in boggy meadows at an altitude of 14,000 feet on the Likiang Snow Range. The leaves are golden yellow beneath, and the large umbels of rich-purple flowers appear in April and early May. When in flower this plant is very striking."

For previous introduction, see S. P. I. No. 55339.

For an illustration of this Chinese primrose, see Plate I.

55900. PRIMULA VINCIFLORA Franch. Primulaceæ. **Primrose.**

"(No. 5782. August 25, 1922.) One of the finest primulas found on the Likiang Snow Range. It grows in company with the preceding, *P. sinopurpurea* [S. P. I. No. 55899], in similar situations, though not nearly so common, for it does not seed readily. The deep indigo-blue flowers are an inch and a half across and, like the preceding, appear quite early."

For previous introduction, see S. P. I. No. 55340.

55901. PRUNUS sp. Amygdalaceæ. **Plum.**

"(No. 6056. August 25, 1922.) A wild plum tree 20 to 25 feet high, of spreading habit, found in limestone soil on the eastern side of the Likiang Plain, opposite the Snow Range, at an altitude of 10,500 feet. It bears perfectly round fruits an inch in diameter, lemon yellow, opaque, with firm sour flesh which is somewhat sweet when absolutely mature. The tree is very healthy and an abundant fruiter and should make a good stock plant where hardiness is desired. The locality where it was collected is subject to drought from October to June, when the heat is intense, and snow falls in the winter."

For an illustration of this Asiatic plum, see Plate II.

55902. RIBES GLACIALE Wall. Grossulariaceæ.

"(August 21, 1922.) A shrub 15 feet high, growing in alpine meadows at an altitude of 12,000 to 15,000 feet on the Likiang Snow Range. The flowers, which vary from cream colored to red, and the red oval berries make this shrub decidedly ornamental."

55903. RUBUS sp. Rosaceæ. **Raspberry.**

"(No. 5834. August 16, 1922.) A raspberry with large rich-green leaflets, collected on the Likiang Snow Range at an altitude of 11,000



A HANDSOME CHINESE PRIMROSE (PRIMULA SINOPURPUREA BALF. F.; S. P. I. No. 55899)

Because of its vigor and free-flowering habit in the high mountains of western China, where it is native, this primrose seems likely to be more satisfactory in cultivation than other members of the "nivalis" section of the genus, to which this species belongs. It was found by J. F. Rock in boggy meadows on the Likiang Snow Range in northern Yunnan at an altitude of 12,000 feet. The plant grows to a height of about 3 feet, and the flower stalks and lower surfaces of the thick dark-green leaves are covered with golden meal. In May the rich rosy purple, fragrant flowers, each about an inch in diameter, are produced in clusters of 6 to 12 or more. (Photographed by J. F. Rock, Yunnan, China, May, 1922; P30216FS)



A DROUGHT-RESISTANT ASIATIC PLUM (PRUNUS SP.; S. P. I. No. 55901)

A hardy wild plum which is drought and heat resistant deserves trial as a stock for regions in the United States where dry hot summers combine with cold winters to make the growing of stone fruits very difficult. This species was discovered in limestone soil on the Likiang Snow Range, Yunnan, China, at an altitude of 10,500 feet, where it grows as a spreading tree 20 to 25 feet high. It bears a large number of round lemon-yellow fruits an inch in diameter. Its native region is subject at times to intense heat and drought, and snow falls in the winter. (Photographed by J. F. Rock, September 1, 1922; P30289FS)

55896 to 55905—Continued.

feet. The yellow fruits the size of a thimble have a delicious flavor. The plant thrives in limestone soil."

55904. RUBUS sp. Rosaceæ.

"(No. 6057. August 24, 1922.) One of the finest species of Rubus on the Likiang Snow Range, where it grows at an altitude of 13,000 feet in forests of *Larix thibetica*. The orange-yellow fruits are larger than any of the cultivated species of Rubus and are rich in color, juice, and flavor."

55905. ROSA sp. Rosaceæ. **Rose.**

"(No. 5835. August 20, 1922.) A shrub 10 feet high, growing in meadows on the Likiang Snow Range at altitudes of 12,000 to 15,000 feet. It is a very ornamental plant, with red stems and red, curved, beadlike fruits. There are innumerable varieties, the flowers varying in color from creamy white to red."

55906. CITRULLUS VULGARIS Schrad. Cucurbitaceæ. Watermelon.

From Palm City, Camaguey, Cuba. Seeds presented by Rudolph Russ. Received October 28, 1922.

Watermelon seeds introduced from Cuba for experimental purposes by department horticulturists.

55907. LEYCESTERIA GLAUCOPHYLLA (Hook f. and Thoms.) C. B. Clarke. Caprifoliaceæ.

From Darjiling, India. Seeds presented by G. H. Cave, curator, Lloyd Botanic Garden. Received October 23, 1922.

A slender plant, closely allied to the honeysuckles, with pale-green leaves and bearing in the early winter a profusion of pink flowers in short axillary spikes. It is native to the subtropical Himalayas at an altitude of 5,000 feet. (Adapted from *Gardeners' Chronicle, 1858, p. 700.*)

55908 to 55910.

From Darjiling, India. Seeds secured from G. H. Cave, curator, Lloyd Botanic Garden, by H. J. Elwes, Colesborn, Cheltenham, England, and presented by J. N. Rose, United States National Museum, Washington, D. C. Received October 20, 1922.

55908. OSBECKIA CRINITA Benth. Melastomaceæ.

A much-branched shrub 4 to 8 feet high, with small, narrow bristly leaves and large purple or pure-white flowers borne in terminal clusters. This plant is abundant at altitudes of 4,000 to 8,500 feet in the mountains of Sikkim and Bhutan, India. (Adapted from *Hooker, Flora of British India, vol. 2, p. 517.*)

55909. PIERIS FORMOSA (Wall.) D. Don. Ericaceæ.

A Himalayan bush, 15 to 20 feet in height, which bears large terminal clusters of white flowers resembling those of the lily of the valley. The glossy green foliage persists throughout the winter, making a very effective background for the flowers. (Adapted from *The Garden, vol. 79, p. 111.*)

55910. SYMPLOCOS GLOMERATA King. Symplocaceæ.

A shrub or small tree becoming 10 feet high, with narrow leathery leaves 6 inches long and axillary clusters of small white flowers. This shrub is rather common in the hills of Sikkim and Bhutan, India, at altitudes of 1,000 to 8,000 feet. (Adapted from *Hooker, Flora of British India, vol. 3, p. 577.*)

55911 to 55913. DAVIDIA spp. Cornaceæ.

From Kew, England. Presented by Dr. A. W. Hill, director, Royal Botanic Gardens, Kew. Received November 2, 1922.

55911. DAVIDIA INVOLUCRATA Baill.

Budwood of a handsome tree from western China, where it reaches a height of 60 to 70 feet; in habit and foliage it resembles a linden. The bright-green oval leaves, 3 to 6 inches long, are sharply toothed and slender stalked, and the globular heads of small flowers, borne on slender nodding stalks about 2 inches long, appear in May and are made unusually striking because of the two or three large white bracts. These bracts are of unequal size, the largest being from 4 to 7 inches long and 2 to 4 inches broad. (Adapted from *Horticulture, vol. 10, p. 433.*)

For previous introduction, see S. P. I. No. 49668.

55912 and 55913. DAVIDIA INVOLUCRATA VILMORINIANA (Dode) Hemsl.

This variety does not show any difference in flower characters from the preceding, but the leaves are smooth, and it may not prove as hardy as the typical form. (Adapted from *Horticulture, vol. 10, p. 433.*)

For previous introduction, see S. P. I. No. 52936.

55912. Seeds. **55913.** Budwood.

55914. BERTHOLLETIA NOBILIS Miers. Lecythidaceæ. **Brazil nut.**

From Santa Cruz de la Sierra, Bolivia. Seeds presented by Juan S. Bowles. Received November 1, 1922.

"The Brazil nut has never been successfully cultivated in any part of the United States, so far as known to us, and is probably too tropical in its requirements for even the mildest wintered sections of Florida and California. It may be possible to grow it in Porto Rico, the Canal Zone, parts of Hawaii, and the Philippines. Seeds received in past years have usually come from northern South America, where are found the principal centers of production. These seeds from Bolivia may yield trees which will be slightly less exacting in their requirements than those from regions nearer the Equator." (*Wilson Popenoe.*)

55915 to 55919. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

From Angol, Chile. Plants presented by the Instituto Agrícola Bunster, Angol. Received November 7, 1922.

"In the orchards of central Chile are cultivated numerous peach varieties of local origin. Most of them are clingstones, for this type is more popular in that country, apparently, than the freestone. Some of them are of large size and fine quality. In fact, they compare very favorably with the best peaches of other countries.

"The peach growers of California are interested in securing the best available clingstone varieties for the production of fruit to be used for canning and preserving. To this end an effort is being made by this office to secure interesting sorts from all parts of the world. The Chilean varieties are worth a careful trial. The following descriptive notes are adapted from the nursery catalogue of the Instituto Agrícola Bunster." (*Wilson Popenoe.*)

55915. *Blanquillo de Mayo.* A very late, productive variety, with medium-sized fruits; excellent for preserves.

55916. *De Vino.* A very good clingstone variety whose season is in March. The fruits are very large, with very dark-red flesh.

55917. *Monstruoso amarillo de Viña del Mar.* A freestone variety which ripens in February. The very large fruits are of excellent quality.

55918. *O'Higgins.* A clingstone variety which ripens in March. The large fruits are a clear yellow.

55919. *Pavía blanco.* The large fruits are of good quality and are excellent for preserves or for drying. Season, February and March.

55920. PLOCAMA PENDULA Ait. Rubiaceæ.

From Orotava, Canary Islands. Seeds presented by Juan S. Bolinaga. Received November 10, 1922.

"A species of low-growing shrub found on the slopes of the arid hillsides in the Canary Islands. It has a most beautiful weeping habit, giving the plants the appearance of tiny weeping willows not over 2½ to 3 feet high. This would be very beautiful as a cover for dry hillsides overlooking the sea. It has already been brought into cultivation and will probably withstand severe drought." (*David Fairchild.*)

For previous introduction, see S. P. I. No. 21611.

55921. POSOQUERIA LATIFOLIA (Rudge) Roem. and Schult. Rubiaceæ.

From Ancon, Canal Zone. Seeds presented by James Zetek. Received November 14, 1922.

"The very conspicuous white flowers of this rubiaceous plant have a sweet perfume somewhat like that of the orange jessamine (*Chalcas exotica* Millsp.)." (*Zetek.*)

A shrub, sometimes 25 feet high, native to the forests of northern Bahia, Brazil, where it grows in dry sandy soil with but little water. It flowers in February, and its succulent fruits, which ripen in July, are sold in the native markets for making marmalade and jelly. The greatest value of the shrub, however, lies in the finely grooved rigid branches, which are highly prized for walking sticks. These are exported to England under the name of "Brazilian oak." (Adapted from *Kew Bulletin of Miscellaneous Information, 1904, p. 9.*)

A handsome plant, worthy of general trial in tropical regions.

55922. CUCUMIS MELO L. Cucurbitaceæ. **Muskmelon.**

From Angol, Chile. Seeds presented by the Instituto Agrícola Bunster, Angol. Received November 13, 1922.

"The melons of Chile, which ripen during the months of February, March, and April, are famous for their delicate flavor and remarkable keeping quality. Recently a number of them have been shipped from Valparaiso to New York, reaching the latter market in good condition. This seed is to be tested in our Southwestern States." (*Wilson Popenoe.*)

55923. PUNICA GRANATUM L. Punicaceæ. **Pomegranate.**

From Tangier, Morocco. Seeds presented by Jules Goffart. Received November 14, 1922.

"A variety of pomegranate with white flowers and fruits, which I found in Reunion. In flavor the fruit is slightly more acid than most varieties. When in flower and in fruit the tree is very ornamental." (*Goffart.*)

For previous introduction, see S. P. I. No. 40856.

55924. DIOSCOREA PENTAPHYLLA L. Dioscoreaceæ. **Yam.**

From Aulnay sous Bois, France. Tubers presented by Prof. R. de Noter, École d'Acclimatation de Recherches Agricoles. Received December 7, 1922.

Variety *Hortorum.*

"*Igname ronde de Chine* (round yam of China). The tubers made the first season, from plants grown from 'eyes' dug and replanted, weigh 1½ kg. each; the second year the tuber may weigh 4 to 5 kg. The plant requires light sandy clay or, better, calcareous, richly fertilized soil. The tubers are gathered at the first frost and stored in the cellar. Two years' storage does not injure but improves the tubers. This yam is an excellent vegetable of delicate flavor and makes delicious fritters, cakes, and soufflés. The leaves, after the harvest, are used as cattle feed." (*De Noter.*)

For previous introduction, see S. P. I. No. 52867.

55925. CITRUS GRANDIS (L.) Osbeck. Rutaceæ. **Pummelo.**
(*C. decumana* Murr.)

From Buitenzorg, Java. Seeds presented by Dr. P. J. S. Cramer, Department of Agriculture, Buitenzorg. Received November 17, 1922.

"A red-fleshed pummelo of fair quality and well-developed color." (*Cramer.*)

For previous introduction, see S. P. I. No. 46336.

55926 to 55955.

From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received November 2, 1922. Quoted notes by Mr. Rock.

55926. ALEURITES sp. Euphorbiaceæ.

"(No. 6163. August 10, 1922.) Seeds of a tree 10 to 15 feet high, which grows wild on the lower slopes of the mountains of the Yangpi Valley, at an altitude of 6,600 feet. It is called *Tung-yu shu* by the natives; oil is obtained from the seeds and used for making oilcloth and also for burning."

55927 to 55929. AMYGDALUS PERSICA L. Amygdalaceæ. **Peach.**
(*Prunus persica* Stokes.)

55927. "(August 10, 1922.) Seeds of a half-wild peach growing near Yangpi, two days from Talifu. The tree is old, with large trunks; the large reddish and green fruits, 4 inches in diameter, are freestone, with firm, sweet, white flesh which becomes red near the seed."

55928. "(Yangpi. August 10, 1922.) Seeds of a half-wild peach growing near a temple. The fruits are 1½ to 2 inches in diameter, clingstone, very juicy and sweet."

55929. "(August 20, 1922.) Seeds of one of the largest fruited peaches I know of, found growing wild in the Likiang Valley. The pointed fruits are 3½ to 4 inches in diameter, clingstone, with firm white flesh of fair flavor."

55930. CASTANEA MOLLISSIMA Blume. Fagaceæ. **Chestnut.**

"(No. 6165. Yangpi. August, 1922.) Seeds of a tree about 40 feet high which grows along the lower western slopes of the Tsangshan Range of the Yangpi Mountains. The trunk is about 2 feet in diameter, and the long narrow leaves are sharply serrate."

55931. CATALPA DUCLOUXII Dode. Bignoniaceæ.

"(No. 3097. Near Nguluke. September 8, 1922.) Cuttings of a tree 70 to 80 feet high, with a diameter of 4 feet or more, growing at an altitude of 9,400 feet in the Likiang Valley. At this altitude the trees do not bear seed. It is a very handsome tree, bearing in early spring large clusters of pinkish purple flowers. The hard, durable wood is very valuable and is used for building purposes."

55932. CRATAEGUS PINNATIFIDA Bunge. Malaceæ. **Hawthorn.**

"(No. 6166. Yangpi. August 10, 1922.) Seeds of a shrub 5 feet high, found at an altitude of 6,000 to 7,000 feet on the lower slopes of the mountains of the Yangpi Valley. The edible fruits are boiled with sugar and candied like jujubes. Native name 'Shan li ko' (mountain pear fruit)."

55933. HEMEROCALLIS FORRESTII Diels. Liliaceæ.

"(Nos. 3841 and 4546. August 27, 1922.) Seeds of a very handsome plant about 2 feet high, growing with *Incarvillea grandiflora brevipes* on the Likiang Snow Range at an altitude of 11,000 feet. It has a thick rootstock, narrow lanceolate leaves, and deep golden orange tubular flowers 2 to 3 inches long borne in many-flowered spikes. It flowers only in very early spring and is suited only for pure limestone soil.

55926 to 55955—Continued.

55934. INCARVILLEA GRANDIFLORA BREVIPES Sprague. Bignoniaceæ.

"(Nos. 4127, 4128, 6122. August 27, 1922.) Seeds of a gorgeous perennial, a foot or more in height, found growing at an altitude of 9,000 to 11,000 feet on the Likiang Snow Range. It has a thick stout rootstock, a large rosette of rich-green leaves, and flowers 3 inches wide. These flowers, which appear in March and April, have a long yellow calyx tube and a corolla which is a rich reddish purple or vermilion. This plant, one of the most striking of early spring, grows in snow-white magnesium-limestone soil."

For an illustration of this variety, see Plate III.

55935. LILIUM TIGRINUM Ker. Liliaceæ. **Tiger lily.**

"(Nos. 4889 and 5357. September 7, 1922.) Bulbs of an orange-flowered lily cultivated by the Mosos in Likiang for the bulbs, which are eaten as a vegetable; only the outer scales are sold, the inner part being kept for planting. This lily grows wild along watercourses in the Likiang Plain at an altitude of 9,000 feet. The numerous large flowers, orange with purple, are very attractive."

55936. MELIOSMA CUNEIFOLIA Franch. Sabiaceæ.

"(Nos. 4410, 4721, 6136. September 3, 1922.) Seeds of a beautiful flowering shrub or small tree 12 feet high, found growing at an altitude of 9,000 to 10,000 feet along watercourses on the northern end of the Likiang Snow Range, usually among limestone bowlders. In habit it resembles the weeping willow, with drooping branches bearing on their apices large pyramidal clusters of cream-colored flowers. During June and July this shrub is an object of great beauty."

55937. PAEONIA DELAVAYI Franch. Ranunculaceæ. **Peony.**

"(No. 6059. September 3, 1922.) Seeds of a very attractive vigorous shrub 4 feet high, growing in rather dry situations north of Likiang among limestone bowlders at an altitude of 9,800 feet. The deep-crimson flowers are 3 inches in diameter."

For previous introduction, see S. P. I. No. 55898.

55938. PAPYRIUS sp. Moraceæ.

"(No. 6162. Langkung. August 16, 1922.) Seeds of a shrub or small tree 10 feet high, which grows along streams at an altitude of 7,000 feet."

This genus includes the well-known paper mulberry.

55939. POLYGALA ABILLATA Buch.-Ham. Polygalaceæ.

"(No. 6167. Yangpi. August 10, 1922.) Seeds of an ornamental shrub 3 to 4 feet high, found growing on the lower mountain slopes at an altitude of 7,000 feet. The bright-yellow flowers are borne in long spikes, and the seed pods are small."

For previous introduction, see S. P. I. No. 49646.

55940. PRUNUS sp. Amygdalaceæ. **Cherry.**

"(September 8, 1922.) Seeds of a cherry tree 25 to 30 feet in height with a trunk 8 to 10 inches in diameter, which grows in the main gorge leading to the snow-capped peak Satseto, (altitude 21,000 feet), among pure limestone rocks, at an altitude of 12,000 feet. The water in the stream bed of this gorge is like milk because of the limestone soil; in the winter the gorge is filled with ice.

"The leaves of this tree are flaccid and bluish green. The long-stemmed bright-red ovoid-oblong cherries appear very late, in September, and are borne singly in the axils of the leaves; the juicy, bitter, bright-red flesh is not firm, and the stone is small. This would probably make a good stock plant for alkaline regions."

55941. PRUNUS sp. Amygdalaceæ. **Plum.**

"(No. 6117. August 26, 1922.) Seeds of a wild plum tree about 20 feet high, which grows along banks of streams in the Likiang Plain at

55926 to 55955—Continued.

an altitude of 9,500 to 10,000 feet. The round lemon-yellow fruits are about an inch in diameter. The tree is a prolific bearer and grows in alkaline soil."

55942 to 55946. ROSA spp. Rosaceæ. **Rose.**

55942. ROSA sp.

"(Nos. 6125, 6127, 6128, 6129, 6130. August 30, 1922.) Seeds of a mixture of a number of closely related forms found in the limestone meadows of Saba, Likiang Snow Range, at an altitude of 11,000 feet. They are all shrubs 8 to 10 feet in height."

55943. ROSA sp.

"(No. 6121. August 28, 1922.) Seeds of a shrub 12 to 15 feet high, with long rambling branches, found along watercourses on the north end of the Likiang Plain at an altitude of 9,000 to 10,000 feet. It bears a large number of white flowers, which are followed by small ovoid orange fruits. When in bloom this shrub is a very striking object."

55944. ROSA sp.

"(No. 6126. August 30, 1922.) Seeds of a shrub 8 to 10 feet high, which grows in a limestone meadow called Saba, in the Likiang Snow Range, at an altitude of 11,000 feet. The flowers are either cream colored or red and the smooth fruits a dull red-brown."

55945. ROSA sp.

"(No. 6435. September 7, 1922.) Seeds of a lovely slender spineless shrub 8 to 10 feet in height, which grows in a deep gorge leading up to the main peak of the Likiang Snow Range, at an altitude of 6,000 feet, among spruce and fir forests and rhododendrons. The soil is usually much impregnated with lime. The shrub is very ornamental both in flower and in fruit. The single flowers are a deep rose red, and the yellow and scarlet shining fruits are long pear shaped."

55946. ROSA sp.

"(No. 6436. September 7, 1922.) Seeds of a slender, very attractive shrub which grows with the preceding No. 6435 [S. P. I. No. 55945] in the limestone gorge leading to the main peak of the Likiang Snow Range, at an altitude of 11,500 to 12,000 feet. The stems and branches are red and spineless except on the young shoots. The flowers are cream colored, and the crimson to carmine fruits are covered with a few soft bristles, are pear shaped, and about an inch in length."

55947. SCILLA sp. Liliaceæ.

"(No. 6169. Kiuho. August, 1922.) Bulbs of a liliaceous plant found growing at an altitude of 7,000 feet. It bears spikes of small rich-purple flowers."

55948 and 55949. VACCINIUM spp. Vacciniaceæ.

55948. VACCINIUM DELAVAYI Franch.

"(No. 6168. August 20, 1922.) Seeds of a very compact hardy shrub which grows on the Tsangshan Range at an altitude of about 8,000 to 9,000 feet. The edible berries, the size of small peas, are purplish black."

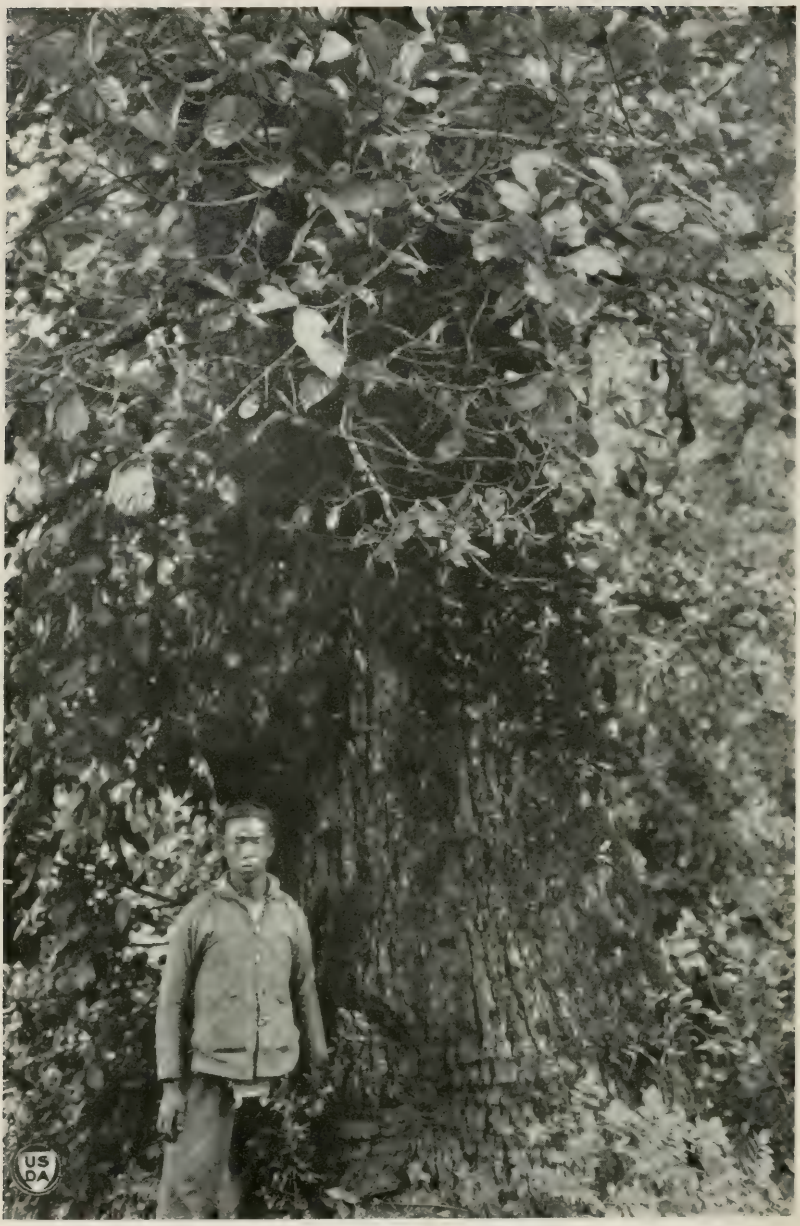
55949. VACCINIUM sp.

"(No. 6437. September, 1922.) Seeds of a shrub 2 feet high, which is very common from the Black River Valley to this locality (Likiang Snow Range), where it grows under pine trees. The flowers are a beautiful pink, and the edible dark-purple fruits, about the size of peas, are quite sweet."



A SHOWY ALPINE PLANT FROM WESTERN CHINA (INCARVILLEA GRANDIFLORA BREVIPES SPRAGUE; S. P. I. No. 55934)

For many years the typical form of this relative of our trumpet vine has been known to horticulturists, but the variety here shown was discovered only a few years ago in western China, whence it was sent to Europe. It is a rather small perennial, a foot or two in height, and differs from the type in having large brilliant-red flowers with canary-yellow markings in the throat, as well as in having more compact flower clusters. The plant illustrated was growing in pure limestone drift on the lower slopes of the Likiang Snow Range, Yunnan, China, at an altitude of 10,500 feet. (Photographed by J. F. Rock, June 2, 1922; P30260FE)



A CHESTNUT FROM THE MOUNTAINS OF SOUTHWESTERN CHINA (CASTANEA SP.; S. P. I. NO. 56080)

In recent years the common chestnut, formerly a conspicuous feature of forests and roadsides in the northeastern United States, has almost disappeared, owing to the ravages of chestnut blight (*Endothia parasitica*), a disease for which no remedy has been discovered. In an effort to obtain blight-resistant chestnuts the Department of Agriculture has introduced from China a number of interesting species. The one here shown is a large tree, about 100 feet tall, with a trunk 5 feet in diameter. The edible nuts are small, but J. F. Rock, through whom the introduction has been made, reports them to be of sweet flavor. (Photographed by J. F. Rock, near Shiaoshuichi, Yunnan, China, September 29, 1922; P30306FS)

55926 to 55955—Continued.

55950 to 55952. VIBURNUM spp. Caprifoliaceæ.

55950. VIBURNUM sp.

"(No. 6061. September 7, 1922.) Seeds of a shrub 5 to 8 feet high, which is the most common Viburnum on the Likiang Plain; it grows almost everywhere, but especially along streams among limestone bowlders and on the lower slopes of the Likiang Snow Range at an altitude of about 10,000 feet. In early spring appear the cymes of white flowers, followed by the drooping clusters of rich red-crimson fruits. These fruits are quite acid, but are used for jams and jellies, giving the jelly a rich-red color. When in fruit the plant is very ornamental; the fruits, which ripen after the first frost, remain firm for two months."

55951. VIBURNUM sp.

"(No. 6160. Talifu. August 20, 1922.) Seeds of an ornamental shrub 5 to 6 feet high, with drooping branches, which grows at an altitude of 10,000 feet on the Tsangshan Range. The flowers are white to cream colored and the fruits black when ripe."

55952. VIBURNUM sp.

"(No. 6161. Ningai. August 10, 1922.) Seeds of an ornamental shrub 4 feet high, found growing on limestone rocks. The flowers are white with a pinkish tinge, and the fruits are black."

55953. VITIS sp. Vitaceæ. **Grape.**

"(No. 6286. September 7, 1922.) Seeds of a very hardy wild grape found covering rosebushes along streams among limestone bowlders in the northern end of the Likiang Snow Range at an altitude of 10,000 feet. The leaves are small, thick, and deeply three lobed. The vine is a prolific bearer. The small dull-purple fruits, a little larger than peas, with large seeds, are borne in racemes 3 to 4 inches long and are very sweet, with no acid taste."

55954. (Undetermined.)

"(No. 6164. August 10, 1922.) Seeds of a tree 30 to 40 feet high, with a trunk 3 to 4 feet in diameter, which grows in deep gulches in the Yangpi Mountains, near Talifu, at an altitude of 10,000 feet. The leaves and fruit resemble those of a Ziziphus."

55955. CORNUS sp. Cornaceæ.

"(September 3, 1922.) Seeds of an ornamental tree about 25 feet high, which grows in the Peshwe Valley, north of the Likiang Plain, at an altitude of 10,000 feet. The leaves are bright green above, white beneath, and the cream-colored flowers are in large cymes. The fruits are purplish black and very ornamental."

55956 to 55963.

From Likiang, Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received November 4, 1922. Quoted notes by Mr. Rock.

55956. LONICERA XEROCALYX Diels. Caprifoliaceæ. **Honeysuckle.**

"(No. 5939. August 27, 1922.) A rare shrub 15 to 20 feet high, which grows at an altitude of 12,000 feet on an alpine meadow known to the Mosos as 'Ma hoang pa tze' (leech meadow). The shrub has horizontal branches, narrow leaves of a rich green, and large rich golden yellow flowers, which appear in May and June. It is an exceedingly handsome species. The small fruits are a tomato red."

55957. MECONOPSIS INTEGRIFOLIA (Maxim.) Franch. Papaveraceæ.

"(Nos. 3358, 3385, 6114. August 27, 1922.) A fine alpine plant 2 feet or more in height, found rather commonly at an altitude of 14,000

55956 to 55963—Continued.

to 14,500 feet among limestone bowlders on the Likiang Snow Range. The leaves are linear, with the basal ones forming a rosette, and covered with red hairs. The large bright-yellow flowers are 4 inches across."

55958 to 55963. ROSA spp. Rosaceæ. **Rose.**

55958. ROSA sp.

"(No. 6118. August 27, 1922.) A handsome shrub with pendent branches, which grows in fir and spruce forests at an altitude of 11,000 feet in the main gorge leading to one of the peaks (21,000 feet altitude) of the Likiang Snow Range. The flowers, which appear in April and May, are rich pink to mauve. The shrub fruits in August."

55959. ROSA sp.

"(No. 6119. August 27, 1922.) A wild rose from the Likiang Snow Range."

55960. ROSA sp.

"(No. 6120. August 27, 1922.) A shrub 15 to 18 feet high, with long rambling branches, found at an altitude of 10,000 feet on the northern end of the Likiang Plain. It is a very ornamental species, with large single white flowers and scarlet fruits covered with soft spines."

55961. ROSA sp.

" (No. 6086. August 27, 1922.) A shrub 4 to 5 feet high, with small leaves, found at altitudes of 13,000 feet and higher, in rocky limestone situations on the Likiang Snow Range. It has very attractive pink flowers."

55962. ROSA sp.

" (No. 6089. August 27, 1922.) A very ornamental shrub 4 feet high, growing on the Likiang Snow Range at an altitude of 13,500 feet. The stems and spines are red, as are also the flowers. The fruits are scarlet and yellow."

55963. ROSA sp.

" (No. 6096. August 27, 1922.) A very small spreading shrub, with small leaves, found at an altitude of 13,500 feet on steep alpine meadows of the Likiang Snow Range, in company with junipers, aconites, and spireas. The flowers are red, and the pear-shaped fruits are orange-red."

55964. ANNESLIA BREVIPES (Benth.) Lindm. Mimosaceæ.

(*Calliandra brevipes* Benth.)

From Rio de Janeiro, Brazil. Seeds presented by J. Simão da Costa. Received November 23, 1922.

"A shrub with beautiful flowers, native to the arid zone of northeastern Brazil." (*Da Costa.*)

The plants of this genus are very attractive because of their graceful feathery foliage and globose flower heads. These flower heads consist of very numerous long purplish stamens which almost entirely hide the small corollas. (Adapted from *Hooker, Journal of Botany, vol. 2, p. 138.*)

55965 to 55971. PYRUS spp. Malaceæ. **Pear.**

From Jamaica Plain, Mass. Trees presented by E. H. Wilson, Arnold Arboretum. Received November 11, 1922. Quoted notes by Mr. Wilson.

55965. PYRUS CALLERYANA DIMORPHOPHYLLA (Makino) Koidz.

" (No. 9635 W.) A variety which forms a tree about 30 feet high with a trunk about a foot in diameter, growing at Hazu, Ise Province, Japan. This tree was raised from seeds collected for me by the Yokohama Nursery Co. in the autumn of 1917."

55965 to 55971—Continued.

55966 to 55970. PYRUS USSURIENSIS Maxim.

55966. "(No. 10657 W.) A variety with small edible fruits. These trees were raised from seeds which I purchased at Pukchin, Province of Keiki, Chosen, August 25, 1918."

55967. "(No. 11254 W.) A variety with small pear-shaped to round fruits. These trees were raised from seeds collected for me by T. Ishidoya at Keijo, Province of Keiki, Chosen, in the late autumn of 1918."

55968. "(No. 11260 W.) *Ishi-nashi.* A stone pear collected for me by H. Suzuki at Yamanaka, Mount Fuji, Japan, in the late autumn of 1918."

55969. (No. 11261 W.) *Pin li.* A flat short-stemmed pear, collected for me by the Yokohama Nursery Co. at Yugakujo, Manchuria, in the late autumn of 1918."

55970. "(No. 11262 W.) *Champa li* (long peduncled). A variety collected for me by the Yokohama Nursery Co. at Mukden, Manchuria, in the late autumn of 1918."

55971. PYRUS USSURIENSIS HONDOENSIS (Kik. and Nak.) Rehder.

"(No. 11266 W.) *Yama-nashi.* A variety collected for me by the Yokohama Nursery Co. at Nagano, Japan, in the late autumn of 1918."

55972 to 55974.

From Freetown, Sierra Leone, Africa. Seeds presented by W. N. Martin, Albert Academy, U. B. C. Received November 17, 1922.

55972. AMARANTHUS sp. Amaranthaceæ.

"A green variety used like spinach." (*Martin.*)

55973. CORCHORUS OLITORIUS L. Tiliaceæ.

This species appears to be important as a vegetable and is cultivated in many tropical countries for that purpose. In Nigeria and Uganda the leaves are used in soups, and in Sierra Leone the plant is used as a potherb. The young and tender leaves are used in salads. (Adapted from *Holland, Useful Plants of Nigeria, pt. 1, p. 115.*)

For previous introduction, see S. P. I. No. 52891.

55974. SYNTHERISMA EXILIS (Kippist) Newbold. Poaceæ. **Fundi.**

"An annual grass, much resembling crabgrass, grown by Nigerian tribes as a supplementary food grain. This grass, called by natives 'fundi,' is often grown in the millet fields and yields a crop of fine seed which is made into flour for the preparation of a kind of porridge. Fundi was known in Africa in 1798, but it was first brought into England in 1842 by R. Clarke, who describes the grain as about the size of mignonette seed. It is sown in May or June, carefully weeded in August, and ripens in September. The plant grows to a height of 18 inches, and the slender stems bend to earth by the weight of the grain. It prefers light or even rocky soil. Clarke says the grain is 'delicious' for food. Fundi was tested at McNeill, Miss., in 1920, and it is believed that it will give from three to five cuttings of hay in a season or a larger amount of pasturage." (*C. V. Piper.*)

For previous introduction, see S. P. I. No. 52736.

55975. PHYLLOSTACHYS AUREA Carr. Poaceæ. **Bamboo.**

From Ermitage, Mons, Belgium. Seeds presented by J. H. de LeHaie. Received November 28, 1922.

"Height 10 to 15 feet; stems one-half to 1 inch in diameter, greenish yellow when young, becoming golden with age, erect, stiff; joints much shortened toward the base; branchlets slender, greenish yellow, becoming darker yellow

as the plant grows older, usually set at a rather acute angle; leaves 2 to 4 inches long, light green above, grayish beneath, one edge serrate, the other smooth; sheaths deciduous, marked with purplish spots and blotches.

"A handsome ornamental form, fairly hardy, and grown generally in public gardens throughout the world. This was one of the earliest introduced forms in California and is found there in many gardens. It is said to be quite drought resistant and with a little protection will survive the winters as far north as Washington, D. C." (*B. T. Galloway.*)

55976. ZEA MAYS L. Poaceæ. **Corn.**

From Buenos Aires, Argentina. Presented by D. S. Bullock, Agricultural Commissioner, Bureau of Agricultural Economics. Received November, 28, 1922.

"From Entre Rios, Argentina." (*Bullock.*)

Maiz amargo (bitter corn). A variety of corn said to have been introduced into Argentina from Hungary in 1902, since which date it has become quite popular in some parts of northern Argentina because of its resistance to the attacks of locusts. A characteristic of this variety which distinguishes it from other varieties is its tendency to stool or produce side shoots. Unless planted close, each plant will produce under favorable conditions from 4 to 10 of these shoots. The leaves are often over 3 feet long and sometimes 4 inches wide and the stalks from 6 to 10 feet tall. There are two forms noted in Entre Rios, one with grayish white kernels and one with yellow kernels, the latter having longer ears than the former. Because of the numerous intergradations, however, it is very difficult to obtain typical ears of either form. The growing season of *maiz amargo* is long, sometimes as long as nine months. In Entre Rios it is sown in November. (Adapted from *Report No. 76, D. S. Bullock, Agricultural Commissioner.*)

55977. ARACHIS HYPOGAEA L. Fabaceæ. **Peanut.**

From Sydney, New South Wales. Seeds presented by G. W. Valder, undersecretary and director, Department of Agriculture. Received November 28, 1922.

"These seeds were originally sent from the United States under the name 'Mammoth.' The Chinese claim that this variety is too large for their purpose." (*Valder.*)

Introduced for the use of specialists in the Department of Agriculture.

55978. EUGENIA DOMBEYI (Spreng.) Skeels. Myrtaceæ. (*E. brasiliensis* Lam.) **Grumichama.**

From Hilo, Hawaii. Seeds presented by Bro. Matthias Newell. Received October 23, 1922.

"The grumichama is found both wild and cultivated in southern Brazil, particularly in the States of Parana and Santa Catharina. Elsewhere, with the exception of Hawaii, it is scarcely known.

"The tree, which grows to the same size as the orange, is shapely and attractive in appearance, with ovate-elliptic, glossy deep-green leaves 2 to 3 inches long. The small white flowers are followed by pendent fruits, round or slightly flattened, the size of a cherry and deep crimson in color. The persistent green sepals which crown the apex are a distinguishing characteristic. The skin is thin and delicate, the flesh soft, melting, of a mild subacid flavor suggesting that of a Bigarreau cherry. The seeds are round or hemispherical when one or two in number; sometimes there are three or more, in which case the size is reduced and they are angular.

"The rapidity with which the fruits develop is surprising; within a month from the time of flowering they have reached maturity and are falling to the ground. Father Tavares states that all the trees do not ripen their crops at the same time, some blooming later than others and thus extending the fruiting season from November to February (in Brazil). Three varieties are distinguished by him, one with dark-red flesh, another with vermilion, and the third with white. All three are said to be equally good in quality. The fruit is usually eaten fresh, but may also be used to make jams and preserves.

"The grumichama (sometimes *grumixama*, to conform to old Portuguese orthography) has recently been planted in California and Florida. In the latter State it has withstood a temperature of 26° F. without injury, which indicates that it is subtropical, rather than strictly tropical, in character. It prefers a deep sandy loam, but succeeds in Florida on shallow sandy soils. Vaughan MacCaughey says: 'In the Hawaiian Islands it is usually about 20 feet high. It requires considerable moisture for its best development, as do all the Eugenias in our flora; the largest crops are borne by plants at the lower levels, up to 300 feet * * * flowering and fruiting continue from July until December, the main crop coming in the fall * * *. The first plants in Hawaii were probably introduced by the Spaniard Don Francisco de Paula Marin, who came to the islands in 1791.' The grumichama is sometimes listed as *Eugenia brasiliensis* Lam. *Stenocalyx brasiliensis* Berg. is another synonym.

"Seedlings are said to commence fruiting when 4 or 5 years old. They grow rather slowly. No one appears to have budded or grafted the species as yet. For its value as an ornamental plant, as well as for its pleasant fruit, the grumichama deserves cultivation throughout the Tropics and Subtropics." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 54777.

55979 to 55981. Myrciaria spp. Myrtaceæ.

From Rio de Janeiro, Brazil. Seeds presented by P. H. Rolfs, director, Escola Superiór de Agricultura e Veterinária, Vicosa, Minas Geraes, Brazil. Received December 21, 1922.

55979. Myrciaria sp.

Jaboticaba.

The jaboticaba (*Myrciaria cauliflora*) is doing very well in Florida, and these seeds are introduced for testing in that State.

55980. Myrciaria sp.

Jaboticatuba.

"The fruits of this variety are much larger than those of the ordinary jaboticaba." (*Rolfs.*)

55981. Myrciaria sp.

Jaboticaba.

The jaboticaba (*Myrciaria cauliflora*), one of the commonest and most popular fruits of the vicinity of Rio de Janeiro, Brazil, now appears to be thriving in southern Florida, and these seeds are introduced for cultural experiments in that State.

55982. Guilielma utilis Oerst. Phœnicaceæ. Pejibaye.

(*Bactris utilis* Benth. and Hook.)

From Limon, Costa Rica. Seeds presented by C. P. Chittenden, manager, United Fruit Co. Received November 16, 1922.

"A red-striped variety of pejibaye of very good eating quality." (*Chittenden.*)

For previous introduction and description, see S. P. I. No. 55807.

55983 to 55992.

From Yunnan, China. Collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received November, 1922. Quoted notes by Mr. Rock.

55983. Castanea sp. Fagaceæ. Chestnut.

"(No. 6256. Yangpi. September 19, 1922.) Seeds of a tall tree 40 feet or more in height, with a trunk 2 feet in diameter, found wild on the southwestern slopes of the Tsangshan Range at altitudes of 8,000 to 9,000 feet. The nuts, very sweet and of delicious flavor, are numerous in the burs, and the strong healthy trees are prolific bearers."

55983 to 55992—Continued.

55984. CASTANEA sp. Fagaceæ. **Chestnut.**

"(No. 6256a. September, 1922.) Seeds of tall trees found wild in the valleys of the Haitung Range, east of the Tali Lake, at an altitude of 8,000 feet. The nuts are larger than those from the mountains near Yangpi, but both are very sweet and delicious in flavor."

55985. CHAENOMELES sp. Malaceæ. **Chinese quince.**

"(Talifu. September 19, 1922.) Seeds of a quince, called in Chinese *Mu kua*, cultivated around Talifu. The tree is 50 to 80 feet tall, with a large trunk. The very aromatic fruits, rich yellow with a reddish tinge, have very firm, hard, yellow flesh."

55986. COLOCASIA ESCULENTA (L.) Schott. Araceæ. **Dasheen.**

"(Talifu. September 22, 1922.) Tubers of a Chinese vegetable called *Yee-tao*, sold in the Talifu market. The plant is grown in dry ground, like corn or wheat, and not flooded. The tubers grow in great numbers around the base of the stem; they are white and mealy and eaten boiled, like potatoes. The flower stalk is about 2 feet long, of a pinkish mauve color, with a slender spathe of the same color, and with cream-colored flowers; the whole is eaten as a vegetable, either fried or boiled."

55987. CORYLUS sp. Betulaceæ. **Hazelnut.**

"(No. 3292. Nguluke. September 11, 1922.) Seeds of a tree 60 to 80 feet in height, with trunks 2 to 3 feet in diameter, found at altitudes of 9,500 to 10,000 feet among limestone bowlders near springs at the foot of the Likiang Snow Range. The tree is handsome, with very large leaves, and bears large edible nuts.

55988. CRATAEGUS PINNATIFIDA Bunge. Malaceæ. **Hawthorn.**

"(Talifu. September 20, 1922.) Seeds of a shrub 6 to 8 feet high, obtained from fruits sold in the Talifu market, where they are strung on fiber. These small applelike fruits mature in September. They have large seeds and rather sour flesh and are candied like jujubes. Chinese name *Shan li ko*."

For previous introduction, see S. P. I. No. 55932.

55989. JUGLANS REGIA L. Juglandaceæ. **Walnut.**

"(Yangpi. September, 1922.) Seeds of wild walnut trees 40 to 50 feet in height, with a spread of nearly a hundred feet, found in the mountains at an altitude of 8,000 feet. The nuts are large, thin shelled, and sweet."

For previous introduction, see S. P. I. No. 54790.

55990. MALUS sp. Malaceæ. **Apple.**

"(No. 6558. Chienchuan. September 15, 1922.) Seeds of a wild apple, tree 20 feet high, with stiff spreading branches, found in a dry, hot, rocky location in the Chienchuan Valley north of Talifu. The fruits are a little larger than a pea, glossy as if varnished, bright red on one side and yellow on the other."

55991. MECONOPSIS INTEGRIFOLIA (Maxim.) Franch. Papaveraceæ.

"(Likiang. September, 1922.)"

For previous introduction and description, see S. P. I. No. 55957.

55992. OSTEOMELES SCHWERINAE C. Schneid. Malaceæ.

"(No. 6554. Langchiung. September 16, 1922.) Seeds of an ornamental, spreading shrub 2 to 3 feet high, found in the Langchiung Mountains at an altitude of 7,500 feet and common in the arid regions north and south of Talifu. It differs considerably from the Pacific species, *Osteomeles anthyllidifolia;* the flowers are pinkish white and very fragrant, and the sweet edible fruits are uniformly dull purple."

For previous introduction, see S. P. I. No. 40033.

55993. FRAXINUS MICRANTHA Lingelsh. Oleaceæ. **Ash.**

From Dehra Dun, India. Seeds presented by R. S. Hole, forest botanist. Received December 21, 1922.

A Himalayan ash with large leathery leaves about 9 inches long and lax terminal panicles of minute flowers. It is very similar to another Himalayan species, *Fraxinus floribunda*, from which it differs in leaf characters and in having a looser panicle. (Adapted from *Engler, Botanische Jahrbücher, vol. 40, p. 217.*)

55994 to 56018.

From Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received November 21, 1922. Quoted notes by Mr. Rock.

55994. PÆONIA DELAVAYI Franch. Ranunculaceæ. **Peony.**

"(Nguluke. September 12, 1922.)"

For previous introduction and description, see S. P. I. No. 55898.

55995. PRIMULA BULLEYANA Forrest. Primulaceæ. **Primrose.**

"(Heshwe. September, 1922.) Seeds of a very attractive primula collected three days' journey north of Likiang at an altitude of 9,000 to 11,000 feet. It is not a bog-loving plant but grows in pine forests."

55996. PYRACANTHA sp. Malaceæ. **Fire thorn.**

"(Likiang. September 11, 1922.) Seeds of a shapely shrub 10 to 15 feet in height, which grows along stream beds in limestone soil throughout the Likiang Plain. It is common all along the road from Talifu to Likiang, and even south of Likiang. When in flower it is very ornamental, but it is especially attractive when loaded with its bright-scarlet fruits from August until winter."

55997. PYRACANTHA sp. Malaceæ. **Fire thorn.**

"(No. 6527. September 14, 1922.) Seeds of a dense shrub 6 to 8 feet in height, which grows with *Prinsepia utilis* in arid situations in the valley beyond Lashipa, two days' journey south of Likiang. It has bright-yellow berries instead of the scarlet fruits which are so common."

55998 to 56016. PYRUS spp. Malaceæ. **Pear.**

"All these wild pears, of which I am sending seeds, are used as stock plants; they are not planted, but are so numerous that the Chinese simply cut them down and bud them. The best pears come from the region between Tienwei, Talifu, and Haitung."

55998. PYRUS sp.

"(No. 6503. Lashipa. September 13 and 14, 1922.) A very hardy pear tree 15 to 20 feet high, found on the Lashipa Plain, one day's travel south of Likiang, at an altitude of 10,000 feet. It has very tough branches, small, oval-oblong, crenate, acute leaves, and bears large numbers of fruits which are the size of small marbles, yellow, acrid, and unpalatable. The tree is generally used by the natives as a stock plant. Wherever the tree grows wild they cut the trunk down to 2 feet from the ground and bud cultivated varieties of pears on it. The tree is exceedingly hardy and drought resistant and also can withstand being inundated."

55999. PYRUS sp.

"(No. 6508. Likiang. September 13, 1922.) A tree 20 feet tall, which is wild all over the region north of Talifu; collected near the village of Luchu on the southwest end of the Likiang Plain. The leaves are oblong, dark green with red veins and petioles, glossy above, acute or rounded at the base and apex. The fruits are the size of marbles, yellowish brown and spotted, acrid, and unpalatable. This tree had a cultivated variety budded on it; the lower branches were loaded with the wild fruit, and the main trunk had an unripe pear of the cultivated variety."

55994 to 56018—Continued.

56000. PYRUS sp.

"(No. 6509. September 13, 1922.) A wild pear tree 20 feet high, found on the Likiang Plain near the village of Lasadje. The leaves do not have red veins and petioles, and the fruits, which are smaller than a marble, are yellow, spotted, acrid, but perfectly black and sweet when ripe. This is a very good stock plant."

56001. PYRUS sp.

"(No. 6511. Lashipa. September 13, 1922.) A wild pear tree 15 to 20 feet high, from dry hillsides at an altitude of 9,000 feet, where it grows with *Pinus sinensis*. The leaves are small, oval-elliptical, with long stems. The small, yellowish brown fruits are the size of marbles."

56002. PYRUS sp.

"(No. 6539. September 15, 1922.) A wild pear tree 25 to 30 feet high, found in the hot valley of Nankaochai near Chienchuan Valley, two and one-half days' journey south of Likiang, at an altitude of 7,000 feet. It has long spreading whiplike branches and very numerous brownish yellow fruits the size of marbles, which are black when fully ripe."

56003. PYRUS sp.

"(No. 6553. September 15, 1922.) A wild pear tree 40 feet in height, found in arid regions in the mountains west of Tengchuan, two days' journey north of Talifu, at an altitude of 6,500 to 7,000 feet. The branches are long and mostly horizontal. The fruits are much larger than those of the other wild pears, with a rich yellowish brown skin and firm butter-yellow flesh which is acrid and unpalatable, though juicy. This species is quite rare: I have seen only two trees."

56004. PYRUS sp.

"(No. 6555. September 15, 1922.) A tree 40 feet high with rambling and ascending branches, found in a dry region of yellow clay or loam on a hillside beyond Tienwei, three days' journey south of Likiang. This species is very rare, only one tree being seen, and is quite distinct from the other wild pears. The long-stemmed solitary fruits, smaller than a coffee berry, were few in number, oblong, and uniformly crimson."

56005. PYRUS sp.

"(No. 6556. September 16, 1922.) A wild pear tree 15 to 20 feet high, of very graceful habit and spineless, found in the Langchiung Valley near the Erhyin River, two days' journey north of Talifu. The leaves are bright green on both sides, and the bright yellowish brown fruits, larger than a marble, are juicy but acrid. The Chinese use this as a stock plant."

56006. PYRUS sp.

"(No. 6557. Langchiung Valley. September 16, 1922.) A wild pear tree 25 feet high, spineless, with dark-green, crenate, elliptic leaves and round, russet-brown, juicy, acrid fruits the size of small marbles and similar to those of No. 6556 [S. P. I. No. 56005]. The tree is a prolific bearer and is used here as a stock plant."

56007. PYRUS sp.

"(No. 6559. September 15, 1922.) A wild pear tree 25 to 30 feet high, with a stout trunk and stiff, spreading branches, found in the dry mountain range south of Chienchuan, three days' journey north of Talifu. The numerous fruits are about half an inch in diameter greenish brown with lighter spots. A good stock plant."

The following are seeds of domesticated varieties.

56008. PYRUS sp.

"(Talifu. September 20, 1922.)"

55994 to 56018—Continued.

56009. PYRUS sp.

"(Haitung, east of Tali Lake. September, 1922.)"

56010. PYRUS sp.

"(Haitung. September, 1922.)"

56011. PYRUS sp.

"(Haitung. September 19, 1922.)"

56012. PYRUS sp.

"(Talifu. September 20, 1922.)"

56013. PYRUS sp.

"(Tienwei. September 15, 1922.)"

56014. PYRUS sp.

"(Tienwei. September 15, 1922.)"

56015. PYRUS sp.

"(Tienwei. September 15, 1922.)"

56016. PYRUS sp.

"(Tienwei. September 15, 1922.)"

56017. ROSA sp. Rosaceæ. **Rose.**

"(No. 6504. September 14, 1922.) Seeds of a spreading shrub or climber with huge rambling branches, 25 feet high with a spread of 30 feet or more, found growing wild, with *Rosa banksiae*, all over the Lashipa Plain, one day's trip south of Likiang. The flowers when first opened are yellow, becoming cream colored and the size of a half dollar. The orange-red fruits are borne in large ample panicles. The shrub is very ornamental in flower and in fruit."

56018. STYRAX LANGKONGENSIS W. W. Smith. Styracaceæ.

"(No. 3198. Langchiung. September 18, 1922.) Seeds of an ornamental shrub 1 to 2 feet tall, which grows in the arid region between Langchiung and Shapi, at an altitude of 7,500 feet. The flowers are large, white, and drooping, with rich reddish brown calyxes."

56019. PRIMULA CHRYSOPA Balf. f. and Forrest. Primulaceæ. **Primrose.**

From Ness, Neston, England. Seeds presented by A. K. Bulley. Received November 22, 1922.

"Come over and see *Primula chrysopa* next spring. It's a thing to say your prayers to." (*Bulley.*)

A tufted perennial marsh-loving primrose from the Province of Yunnan, China, where it grows in moist stony alpine meadows. It has oblong, bright-green, somewhat fleshy, long-stemmed leaves and very attractive fragrant flowers borne in two to four flowered umbels on the summit of the slender scape. The calyx is green or purplish and the oblique corolla pale lilac with a golden eye. The entire plant is more or less covered with a white mealy powder. (Adapted from *Transactions of the Botanical Society of Edinburgh, vol. 27, p. 277.*)

56020. GUILIELMA UTILIS Oerst. Phœnicaceæ. **Pejibaye.**
(*Bactric utilis* Benth. and Hook.)

From San Jose, Costa Rica. Seeds purchased through Otón Jiménez. Received December 19, 1922.

A shipment of seeds of the pejibaye. For an extended account of this interesting food palm, see the Journal of Heredity, vol. 12, pp. 154–166, April, 1921.

For previous introduction, see S. P. I. No. 55982.

56021. Escallonia philippiana (Engler) Masters. Escalloniaceæ.

From Exeter, England. Plants purchased from Robert Veitch & Son, The Royal Nursery. Received November 25, 1922.

This ornamental shrub, native to Chile, is the hardiest of all the Escallonias, and unlike the other species is deciduous. It forms a spreading shrub with gracefully arching branches and has small dark-green leaves which serve admirably as a background for the pretty star-shaped white flowers. (Adapted from *Gardening Illustrated, vol. 38, p. 501.*)

56022. Warszewiczia coccinea (Vahl) Klotzsch. Rubiaceæ.
Scarlet plume.

From Gamboa, Canal Zone. Seeds presented by F. Marti. Received November 28, 1922.

"This is a remarkable ornamental tree; I first saw it on the banks of Gatun Lake at Rio Sucio. At a distance its racemes, over 2 feet long, with their brilliant-scarlet enlarged sepals, produced a startling splash of color against the dark-green foliage. The color is as vividly scarlet as the autumn colors of the sour gum, the sorrel tree, or some species of Japanese maple. The colored 'leaves' are in reality enlarged sepals. Only one flower in each cluster of flowers on the raceme has an enlarged sepal. Though the flowers themselves are not over a quarter of an inch in diameter, the enlarged sepals are often 2½ inches long. The fact that this tree blooms in summer, the wet season, whereas most of the showy flowering trees of the Tropics bloom in the dry season, would seem to make this an unusually valuable ornamental tree for tropical regions. It is certainly worthy of a place in every collection of tropical trees." (*David Fairchild.*)

For previous introduction, see S. P. I. No. 54297.

56023. Fragaria chiloensis (L.) Duchesne. Rosaceæ.
Chilean strawberry.

From Guayaquil, Ecuador. Seeds presented by Dr. F. W. Goding, American consul general. Received December 7, 1922.

"These seeds were obtained at Guachi, near Ambato. While the fruit of the Chilean strawberry is inferior in flavor to that of our best cultivated strawberries, it is remarkable for its excellent shipping and keeping qualities; and it seems that varieties might be produced by selection which would merit cultivation on a commercial scale.

"The berry is much used for canning and preserving. It is also eaten fresh. It is a curious circumstance that this species of strawberry, whose fruits are commonly an inch to an inch and a half long, should be called *frutilla* (little fruit) in Chile, Peru, and Ecuador, while the much smaller fruit of *Fragaria vesca*, rarely over one-half an inch long, is termed *fresa*, or strawberry. This last-named species is cultivated commercially at Quillota, Chile, whence the fruit, which ripens earlier than that of *F. chiloensis*, is sent to the markets of Santiago.

"As far as I can ascertain by careful examination of the plants and fruits, the *frutillas* of Chile, Peru, and Ecuador are the same species. Neither in Peru nor in Chile, however, do the plants bear all through the year as they do on the sandy plains near Ambato, Ecuador. I imagine the difference in climatic conditions is the cause of this; on the Equator there are no well-defined seasons, and the plants remain active throughout the year, while in Chile the seasons are fairly well defined and vegetative activity ceases during a part of each year, as with us. The ripening season of *F. chiloensis* in the highlands of southern Peru and central Chile seems to extend, approximately, from the latter part of October to January." (*Wilson Popenoe.*)

For previous introduction, see S. P. I. No. 54630.

56024. Cornus officinalis Sieb. and Zucc. Cornaceæ.

From Rochester, N. Y. Seeds presented by John Dunbar, Assistant Superintendent of Parks. Received December 8, 1922.

"This resembles *Cornus mas* when in flower, but the fruits ripen in October and November and are quite handsome." (*Dunbar.*)

This species, which is very closely allied to *C. mas*, is native to Chosen and is occasionally seen in cultivation. Like *C. mas*, it has yellow flowers and red fruits, but differs in having conspicuous patches of dense, rust-colored down on the lower surfaces of the leaves and also is somewhat coarser in habit.

56025. CUCURBITA MOSCHATA Duchesne. Cucurbitaceæ. **Squash.**

From Libia, North Africa. Seeds presented by Dr. E. O. Fenzi. Received December 8, 1922.

"Seeds of a local variety which weighs about 50 kilos (110 pounds). It is very popular with the natives, and with good reason, for the flesh is more intensely colored, sweeter, and of better flavor than any other variety I can remember having seen either in Italy or California." (*Fenzi.*)

56026. ORYZA SATIVA L. Poaceæ. **Rice.**

From Samarlkota, India. Seeds presented by Dr. R. H. Forbes, Kulikoro, French West Africa. Received June 13, 1922. Numbered December, 1922.

"Rice from Samarlkota, Madras Presidency, India." (*Forbes.*)

Introduced for department specialists engaged in rice-breeding experiments.

56027. RICINUS COMMUNIS L. Euphorbiaceæ. **Castor-bean.**

From Albion, Brisbane, Queensland. Seeds presented by W. Ewart, secretary, Queensland Acclimatisation Society. Received December 8, 1922.

"*Bowen Hills.* This variety was raised from seeds obtained by the Queensland Acclimatisation Society from Bowen Hills and grown at Lawnton, Queensland, where it is considered the best of 60 varieties there cultivated. The plant is a vigorous grower, forms numerous large seed heads, and is remarkably free from disease and insect pests." (*Ewart.*)

56028. DAVIDSONIA PRURIENS F. Muell. Cunoniaceæ.

From Sydney, New South Wales. Seeds presented by J. H. Maiden, director and Government botanist, Botanic Gardens, Sydney, at the request of C. T. White, Government botanist, Brisbane. Received November 14, 1922.

Variety *jerseyana*. This variety differs from the northern Queensland form in being smaller in all its parts.

The northern form is a tree 30 or 40 feet high, of graceful erect habit, with drooping compound leaves 18 inches or more long; the terminal leaflet is often a foot in length. The reddish flowers are in clusters a foot or more long, and the fruit is an oval juicy drupelike berry the size of a goose egg, covered with a thin coating of irritating hairs; these, however, are easily removed by rubbing with a rough cloth, and then is exposed the smooth plumlike skin of the fruit. The soft, fleshy, rich-purple pulp, sharply acid in flavor, incloses a few small flat seeds. This fruit, which ripens in July in Queensland, is largely used by the settlers for making into jam and jelly. (Adapted from *Queensland Agricultural Journal, vol. 2, p. 471*, and *Bailey, Queensland Flora, pt. 2, p. 538.*)

56029. PHLEUM PRATENSE L. Poaceæ. **Timothy.**

From Ayr, Ayrshire, Scotland. Seeds purchased from McGill & Smith. Received December 8, 1922.

Locally grown seed introduced for department specialists engaged in timothy-breeding investigations.

56030. CUCUMIS SATIVUS L. Cucurbitaceæ. **Cucumber.**

From Balavaini, Marovo Lagoon, Solomon Islands. Seeds presented by H. T. Fairbrother. Received December 18, 1922.

"Seeds of our native cucumber, which is far ahead of any other I have ever tasted. It is of medium size, with a smooth skin and an incomparable flavor." (*Fairbrother.*)

56031. CHRYSOPHYLLUM MAGALISMONTANA Sond. Sapotaceæ.

From Pretoria, Transvaal. Seeds presented by I. B. Pole Evans, chief, Division of Botany. Received December 18, 1922.

An ornamental evergreen shrub or small tree which is common on stony outcrops in the Transvaal on frostless ridges at an altitude of 6,000 feet near Johannesburg and also in the "Middle Veld" at altitudes below 4,000 feet. The fruits, up to an inch in diameter, are agreeably acidulous and most refreshing in hot weather; they are used by the white colonists for making preserves and jelly. The natives call the tree *Stam-vruchte*, because the flowers and fruits are borne on very short stalks on the stem and main branches. The tree tolerates great heat and drought. (Adapted from *note of J. Burtt Davy under S. P. I. No. 19384.*)

For previous introduction, see S. P. I. No. 19384.

56032 to 56057. TRITICUM AESTIVUM L. Poaceæ.
(*T. vulgare* Vill.) **Common wheat.**

From Tulun, Irkutsk, Russia. Seeds presented by Victor Pissareff, director of the Agricultural Experiment Station. Received December 9, 1922.

"These varieties of winter wheat have endured the winter at Tulun, which is considered beyond the northern limit of wheat growing." (*Pissareff.*)

56032. *Tulun 365.*
56033. *Tulun 366.*
56034. *Tulun 367.*
56035. *Tulun 370.*
56036. *Tulun 373.*
56037. *Tulun 375.*
56038. *Tulun 377.*
56039. *Tulun 379.*
56040. *Tulun 380.*
56041. *Tulun 382.*
56042. *Tulun 383.*
56043. *Tulun 384.*
56044. *Tulun 385.*
56045. *Tulun 389.*
56046. *Tulun 390.*
56047. *Tulun 392.*
56048. *Tulun 398.*
56049. *Tulun 403.*
56050. *Tulun 408.*
56051. *Tulun 405.*
56052. *Tulun 416.*
56053. *Tulun 418.*
56054. *Tulun 425.*
56055. *Tulun 456.*
56056. *Tulun 457.*
56057. *Tulun 458.*

56058 and 56059. CITRUS spp. Rutaceæ.

From Swatow, China. Plants presented by Rev. A. H. Page. Received December 21, 1922. Quoted notes by Mr. Page.

"These fruits, among the very best of the citrus fruits of China, grow chiefly in the low delta region crossed by the Tropic of Cancer, where there is a slight frost perhaps once in 10 years, during the period when the trees are dormant."

56058. CITRUS NOBILIS DELICIOSA (Ten.) Swingle. **Mandarin orange.**

"A tangerine which is as large and fully as sweet as the navel orange."

For previous introduction, see S. P. I. No. 45938.

56059. CITRUS sp.

"The 'soft orange,' which, like the tangerine, is easily peeled when thoroughly ripe. It will keep a long time without ice and becomes very sweet. It is only of medium size."

56060 to 56063. RIBES spp. Grossulariaceæ.

From Elstree, Herts, England. Presented by Hon. Vicary Gibbs. Received December 18, 1922.

56060. RIBES HENRYI Franch.

Plant. An unarmed evergreen shrub, about 3 feet high, native to the vicinity of Szechwan in Hupeh, China. The oval dark-green leaves are

56060 to 56063—Continued.

up to 4 inches in length, and the small oval-oblong berries are crowned by the persistent calyx. This species bears considerable resemblance to *Ribes laurifolium* Jancz. (Adapted from *Bulletin Mensuel de la Société Linnéenne Paris, new series, No. 9, p. 87,* and *Gardeners' Chronicle, 3d ser., vol 71, p. 213.*)

56061. RIBES LAURIFOLIUM Jancz.

Plant. A very attractive flowering currant first discovered in Szechwan, western China, at an altitude of 7,000 feet, where it grows as an evergreen unarmed shrub up to 6 feet in height; not common. The rich-green oval leaves are coarsely toothed and up to 5 inches in length. The greenish yellow flowers are borne in pendent clusters over 2 inches long, appearing in February and March. (Adapted from *The Garden, vol. 79, p. 171.*)

56062. RIBES LONGERACEMOSUM Franch.

Cuttings. "This species, found in the mountains of western China, bears large black fruits of good flavor, in racemes a foot and a half long." (*E. H. Wilson, Naturalist in Western China, vol. 2, p. 31.*)

For previous introduction, see S. P. I. No. 40459.

56063. RIBES MAXIMOWICZII Batal.

Cuttings. A deciduous shrub 6 to 9 feet high, first found by the Russian traveler Potanin, in Kansu, in 1885, but introduced into England several years later from western China. The leaves, in threes or fives, are 2 to 5 inches wide, glossy green above and pale downy beneath. The flowers, borne in long slender clusters in May, are made conspicuous by the dull lurid-red calyxes. The fruits, which are thickly covered with stiff glandular bristles, are, according to E. H. Wilson, sometimes orange and sometimes red, possibly at different stages of development. (Adapted from *Gardeners' Chronicle, 3d ser., vol. 59, p. 273.*)

For previous introduction, see S. P. I. No. 40410.

56064 to 56066. SACCHARUM OFFICINARUM L. Poaceæ. Sugar cane.

From Fajardo, Porto Rico. Seeds presented by R. A. Veve, Experiment Station, Fajardo Sugar Co. Received December 28, 1922. Quoted notes by Mr. Veve.

"These three varieties are very good in our district, and their seed germinates very well. Although all three of them are susceptible to mosaic disease, they are more resistant than the native varieties *Cristalina* and *Rayada*, which are here considered as standards."

56064. *D109.*

For previous introduction, see S. P. I. No. 49262.

56065. *D433.*

For previous introduction, see S. P. I. No. 49264.

56066. *F. C. 306.* "This is a local variety, a seedling of D433."

56067. PANGIUM EDULE Reinw. Flacourtiaceæ. Pangi.

From Manila, Philippine Islands. Seeds presented by A. Hernandez, director, Bureau of Agriculture. Received December 13, 1922.

"Seeds of pangi (*Pangium edule*) obtained from the barrio of Panagan, municipality of Lagonoy, Camarines Sur. Pangi seeds yield about 50 per cent of pitjoeng or samaun oil having the following constants (see Bureau of Forestry, Manila, Philippine Islands, Bulletin No. 20, p. 159):

Specific gravity	0.937
Saponification value	178–183
Iodin value	89.94
Titer test of fatty acids	44.4°

—(*Hernandez.*)

"I have just eaten this fruit for the first time: it is quite similar to the *marang* (*Artocarpus odoratissima* Blanco) in flavor, being very sweet and rich. The flesh is rather scant and the seeds large, but some day we may discover a seedless one and then we shall have a real feast. The fruit is so large that one (seedless) would be enough for three to five people." (*P. J. Wester.*)

A Philippine tree which reaches a height of 25 meters (82 feet), with very large, smooth, pointed leaves and yellowish green flowers. The oval brown fruit is over 6 inches long and contains several seeds imbedded in a yellowish, edible pulp. The fresh seeds are poisonous, but steeping in water makes them edible. (Adapted from *Brown, Wild Food Plants of the Philippines, p. 126.*)

56068. Dendrocalamus sikkimensis Gamble. Poaceæ. Bamboo.

From Sibpur, near Calcutta, India. Seeds presented by C. C. Calder, curator, Royal Botanic Garden. Received December 11, 1922.

"This bamboo flowered profusely this year in the Darjiling District." (*Calder.*)

For previous introduction and description, see S. P. I. No. 55815.

56069 and 56070.

From Buitenzorg, Java. Seeds presented by Dr. P. J. S. Cramer, Director of the General Experiment Station. Received December 18, 1922.

56069. Citrus medica L. Rutaceæ. **Citron.**

Seeds of a peculiar citron with papayalike fruits from Java.

56070. Garcinia mangostana L. Clusiaceæ. **Mangosteen.**

These seeds are introduced from Java in the hope of establishing the mangosteen in our tropical dependencies.

For previous introduction and description, see S. P. I. No. 55496.

56071. Dioscorea alata L. Dioscoreaceæ. Greater yam.

From Fort Pierce, Fla. Tubers presented by C. S. Steele. Received December 28, 1922.

"This yam is a strain selected from the Hawaiian purple-skinned yam, S. P. I. No. 46768. The purple layer, just beneath the outer skin, was very thin and sharply defined in the selected tuber, and the flesh of the tuber was white and of good quality when cooked. Yams of the purple-skinned type vary considerably with respect to the thickness of the purple layer and also in quality, and it is still to be determined whether this selection will remain constant." (*R. A. Young.*)

56072 to 56074. Phaseolus spp. Fabaceæ.

From Santiago de las Vegas, Cuba. Seeds presented by Dr. Mario Calvino, director, Agricultural Experiment Station. Received December 29, 1922. Quoted notes by Doctor Calvino.

56072. Phaseolus calcaratus Roxb. **Rice bean.**

"*Frijol mambi* or *Diablito.* Seeds of this variety were originally sent from Oriente, where the plant grows spontaneously in the thickets. The seeds are small, about the size of a grain of rice, kidney shaped, and dark red. It is a pole bean of rapid growth and is very productive."

56073. Phaseolus lunatus L. **Lima bean.**

"This is a good variety of pole Lima which I imported from Trujillo, Peru."

56074. Phaseolus vulgaris L. **Common bean.**

"*Frijol negro.* One of the cultivated varieties of Cuba."

56075 to 56079.

From Santiago de las Vegas, Cuba. Seeds presented by Dr. Mario Calvino, director, Agricultural Experiment Station. Received December 30, 1922. Quoted notes by Doctor Calvino.

56075 and 56076. PHASEOLUS LUNATUS L. Fabaceæ. **Lima bean.**

"The following Lima beans are cultivated in Cuba."

56075. Light-red beans. **56076.** Dark-red beans.

56077 to 56079. VIGNA spp. Fabaceæ.

56077. VIGNA CYLINDRICA (Stickm.) Skeels. **Catjang.**

"*Frijol precioso.*"

56078 and **56079.** VIGNA SESQUIPEDALIS (L.) Fruwirth. **Yard-Long bean.**

56078. "*Habichuela china negra.*"

56079. "*Habichuela china variegata.*"

56080 to 56117.

From Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received December 6, 1922. Quoted notes by Mr. Rock.

56080 to **56083.** CASTANEA spp. Fagaceæ. **Chestnut.**

56080. CASTANEA sp.

"(No. 6682. September 29, 1922.) A tree 60 to 100 feet tall, with trunk 4 to 5 feet in diameter, and hard, tough dark-brown wood, found at an altitude of 8,200 feet, and very common, four and a half days' journey west of Talifu, beyond a village called Paitoupu and 40 li (12 miles) from Yungping, where it forms dense forests. The leaves are large, broadly ovate, coarsely serrate, glossy above and silvery beneath. The burs are borne in spikes, with thick, green, short spines in spiral ridges, similar to those of *Castanea armata*. The nuts are very small, someth ng like those of the chinquapin, and very sweet and palatable. The natives cut the tree for firewood a foot above the ground; it ratoons very freely, sending forth shoots from the old stump. I have not seen any evidence of disease in any of the trees of this species, although I have examined many trees. The timber is excellent, being used for building purposes."

For an illustration of the trunk of this chestnut, see Plate IV.

56081. CASTANEA sp.

"(No. 6683. September 30, 1922.) A tree 50 to 60 feet high, with a straight trunk 1 to 2½ feet in diameter and ascending branches, found in yellow clay loam in forests 20 li (6 miles) from Paitoupu, four and a half days' journey west of Talifu, at an altitude of 8,200 feet. The dark-green leathery leaves are very handsome, and the numerous burs, larger than those of the following [S. P. I. No. 56082], are borne in lateral spikes. The nuts are very sweet and delicious. These trees are perfectly healthy. Trees of this species are also found on the western slopes of the Tsangshan Range, but their fruits are all attacked by worms."

56082. CASTANEA sp.

"(No. 6683a. September 30, 1922.) A tree of the same size as the preceding [S. P. I. No. 56081] and with leaves similar but a paler green, found in the mountains 20 li (6 miles) from Paitoupu near a hamlet called Shiaoshui. The burs are smaller, with the spines arranged differently, and shorter and sharper. The nuts are the same size."

56080 to 56117—Continued.

56083. CASTANEA sp.

"(No. 6686. September 28, 1922.) This is the same as No. 6682 [S. P. I. No. 56080], but was collected near Taipingpu, three days' journey west of Talifu. The seeds were gathered from young shoots, for the trees had all been cut down."

56084. CATALPA DUCLOUXII Dode. Bignoniaceæ.

"(Nos. 3097, 3217.) A tree 80 feet tall, with a straight trunk 3 to 4 feet in diameter, found in the Likiang Plain at an altitude of 8,800 feet; in large groves also south of Talifu on the Menghau Ting Plain. The pinkish lilac flowers are borne in large full panicles and make the tree very ornamental. It is a very valuable timber tree, and the wood is not attacked by insects. Seeds of this tree are exported from Tengyueh to other parts of Yunnan, Tengyueh being the center of distribution. The Chinese name is *Chun nin shu*."

For previous introduction, see S. P. I. No. 55931.

56085. CORNUS CAPITATA Wall. Cornaceæ. **Bentham's cornel.**

"(No. 6684. September 29, 1922.) A tree 30 feet or more in height with a trunk a foot or more in diameter, or at times only shrubby, found beyond Paitoupu, two days' journey west of Yangpi, at an altitude of 8,000 feet. The fruits, larger than a large strawberry and of the same shape and color, have sweet yellow flesh and are much relished; they are often sold in the markets."

56086. CORYLUS sp. Betulaceæ. **Filbert.**

"(No. 6635. September 24, 1922.) A shrub 6 to 10 feet high, with large hairy leaves, found among mica bowlders at the foot of the steep hills rising behind Kinngintui, a village not far from Yangpi, at an altitude of 6,000 feet. At this time of the year the weather here is hot. The fruits, of fairly large size, are sweet and of a flavor like that of hazelnuts. This shrub is worthy of cultivation for the nuts."

56087. CRATAEGUS PINNATIFIDA Bunge. Malaceæ. **Hawthorn.**

"(No. 6685. September 27, 1922.) A tree 30 to 35 feet high, with straight ascending branches, found wild between Yangpi and Taipingpu, four days' journey west of Talifu. The large-seeded yellowish red fruits, the size of crab apples and ridged, are borne in large clusters at the ends of the branches; they are candied by the natives."

For previous introduction, see S. P. I. No. 55988.

56088 to 56090. DIOSPYROS spp. Diospyraceæ **Persimmon.**

56088. DIOSPYROS LOTUS L.

"(No. 6693. September 25, 1922.) A wild persimmon found near watercourses on the hills back of Kinngintui, 20 li (6 miles) east of Yangpi, at an altitude of 6,000 feet. The fruits are the size of a large green olive."

56089. DIOSPYROS LOTUS L.

"(No. 6705. October, 1922.) A spreading tree 50 feet high with a drooping crown, found wild on the Salwin watershed, western slope of the Salwin Valley above Homushu, at an altitude of 7,000 feet. The tree was loaded with the small yellowish green persimmons, less than an inch in diameter."

56090. DIOSPYROS sp.

"(October 3, 1922.) A tree 35 feet high with a large spreading crown, which grows half wild on the hillsides near Shayang, two days' journey east of Yungchang. The edible persimmons, the size of a tennis ball, are orange-yellow and are very sweet and delicious."

56091. JUGLANS REGIA L. Juglandaceæ. **Walnut.**

"(No. 6694. September 27, 1922.) A very large tree with a huge crown, which is very numerous on the hills and slopes near Taipingpu.

56080 to 56117—Continued.

at an altitude of about 8,300 feet. The nuts are very thick shelled and difficult to break and are gathered by the natives for the sake of the oil. There are several varieties which vary in the shape of the nuts, some being oblong, some ovoid, and some globular; all are thick shelled."

56092 to 56099. MALUS spp. Malaceæ. **Apple.**

56092. MALUS sp.

"(No. 6687. September 28, 1922.) A large tree with a large crown of ascending branches, found beyond Taipingpu, three days' journey west of Talifu, at an altitude of 8,200 feet. The yellowish green fruits are 2 inches in diameter, fragrant but sour."

56093. MALUS sp.

"(No. 6688. September 27, 1922.) A wild apple tree from the Yangpi Mountains, two days' journey from Talifu, where it grows at an altitude of 7,800 feet. The fruits are bright red and yellow, with rather numerous seeds."

56094. MALUS sp.

"(No. 6690. September 27, 1922.) A tree 30 feet in height with a trunk 2 to 2½ feet in diameter and straight ascending branches, found wild in red clayey soil all over the ranges between Yangpi and Taipingpu, at an altitude of 8,000 feet. The oblong leaves are dark green above and pale beneath; the very numerous fruits, the size of small apples, are yellowish with a bright reddish tinge, with firm, very fragrant but sour flesh. The tree is exceedingly hardy and free from disease and occurs here where nothing else will grow except the hardy Yunnan pine (*Pinus sinensis*)."

56095. MALUS sp.

"(No. 6691. September, 1922.) A peculiar tree with long spreading, drooping branches like a willow, found only along watercourses between Yangpi and Taipingpu, at an altitude of 8,300 feet. The tree was loaded with small oblong fruits less than an inch long and half an inch in diameter, with dull carmine-red skin and very juicy sour flesh. I did not see this species elsewhere."

56096. MALUS sp.

"(No. 6696. September 30, 1922.) A fine hardy tree 15 to 20 feet high, which grows wild with *Castanea* sp., in the hills between Huanglienpu and Chutung. The yellowish red fruits are 2 inches in diameter."

56097. MALUS sp.

"(No. 6696. September, 1922.) Seeds of the preceding [S. P. I. No. 56096] collected beyond Shiashuichi. The flowers are red."

56098. MALUS sp.

"(No. 6698. October 4, 1922.) A tree 20 feet tall which grows wild in the mountains beyond Pingpo, on top of the western ridge of the Mekong Valley, at an altitude of 8,000 feet. The tree was loaded with thousands of dark-crimson, oblong, mealy fruits the size of wild cherries; in fact, the tree could be mistaken at a short distance for a cherry tree. It is a prolific bearer and grows in clay loam mixed with slate."

56099. MALUS sp.

"(No. 6713. October, 1922.) A wild apple tree 20 to 30 feet high, sent to me through the kindness of Rev. Mr. Fullerton, of the Szemao Mission; it grows in the mountains near Szemao at an altitude of 5,000 feet or more. The globose fruits are little more than an inch in diameter and are called *toi*."

56080 to 56117—Continued.

56100. (Undetermined.)

"(No. 6689. September 27, 1922.) A tree 30 feet in height, found in the forests 20 li (6 miles) from Paitoupu, on steep hillsides with *Gaultheria* spp., at an altitude of 8,100 feet. It is exceedingly ornamental, with its shining dark-green leaves and great masses of papery crimson berries; it excels holly in every respect as a decorative plant."

56101 to 56111. PYRUS spp. Malaceæ. **Pear.**

56101. PYRUS sp.

"(No. 6636. September 24, 1922.) A wild pear tree 15 feet high, which grows in well-drained soil among huge bowlders on the steep hillsides back of the temple of Fu Kwe Ssu, back of the village of Kinngintui, 20 li (6 miles) from Yangpi. The fruits, larger than any of the ordinary wild pears collected (except No. 6553 [S. P. I. No. 56003]), are more pear shaped, with yellowish brown skins and very juicy subacid flesh. This species is very hardy and perfectly free from disease. The region where it grows has a hot, dry spring, a rainy summer, a hot, humid autumn, and a cold winter season of two months."

56102. PYRUS sp.

"(No. 6703. October, 1922.) A wild pear tree 25 feet high which grows near Talishao at an altitude of 8,000 feet. The very numerous fruits, the size of crab apples, have yellowish brown skin, yellow flesh, and large seeds."

56103. PYRUS sp.

"(No. 6764. October, 1922.) A wild pear tree 30 feet high found growing with the preceding [S. P. I. No. 56102] near Talishao. The tree was loaded with the globular russet-brown fruits, an inch in diameter, with very juicy, sour flesh."

56104. PYRUS sp.

"(No. 6711. September, 1922.) A tree 20 to 25 feet high, with spreading whiplike branches, found wild in the mountains between Hochiang and Pingpo, above the Hsiakuan River. The tree was loaded with small oval russet fruits, half an inch in diameter, with sour yellow flesh."

56105 to 56110. Seeds of domesticated varieties.

56105. PYRUS sp.

"(Yungchang, October 5, 1922.)"

56106. PYRUS sp.

"(Yungchang, October 5, 1922.)"

56107. PYRUS sp.

"(October 16, 1922.)"

56108. PYRUS sp.

"(October 5, 1922.)"

56109. PYRUS sp.

"(Yangpi. September 26, 1922.)"

56110. PYRUS sp.

"(Yungchang, October 5, 1922.)"

56111. PYRUS sp.

"(October, 1922.) A tree 30 feet high, with ascending whiplike branches, found wild in the valley between Shiashuichi and Chutung, at an altitude of 6,500 feet. The tree was loaded with the small, ovoid, russet-yellow, very juicy fruits and was very ornamental."

56112. QUERCUS sp. Fagaceæ. **Oak.**

"(No. 6712. September, 1922.) A shrubby oak 10 feet high, which forms dense bushes on the hills beyond Hsiakuan, one day's trip west of Talifu, at an altitude of 6,800 feet. The tree is a heavy bearer, but the acorns are not palatable."

56080 to 56117—Continued.

56113. Rosa roxburghii Tratt. Rosaceæ. **Rose.**

"(No. 6583. September 23, 1922.) A low shrubby rose 2 to 4 feet high, distributed from Talifu to the Hsiakuan Plain, at an altitude of 6,800 feet. It is a very attractive rose, with its large, handsome bright-red buds and large, bright magenta-red flowers. The compressed fig-shaped fruits are an inch in diameter."

56114. Rubus sp. Rosaceæ.

"(No. 6706. October, 1922.) A spineless shrub 8 feet high, with ascending branches, found at an altitude of 8,000 feet on the top of the range separating the Salwin and Shweli watersheds. The leaves, palmately divided into three to five separate leaflets, are prominently ribbed and silvery beneath, and the solitary small fruits are yellowish red and watery. The shrub is very ornamental."

56115. Thea sp. Theaceæ.

"(No. 6697. October 2, 1922.) A tree 40 to 50 feet tall, with a trunk over a foot in diameter, found growing in the temple grounds of Yung Kwe Ssu, between Yungping and Shayang, at an altitude of 8,000 feet. The flowers are said to be white and 4 inches across and the fruits as large as a man's fist."

56116. Viburnum sp. Caprifoliaceæ.

"(No. 6699. October 4, 1922.) A beautiful shrub 5 to 8 feet in height, of spreading habit, found on the ridges beyond the valley of the Mekong, between Pingpo and Pangchiao, at an altitude of 8,000 feet, in a forest composed of *Pinus armandi* and *Thea* sp. The shrub was covered with clusters of small crimson berries which were almost transparent. They are somewhat acid and may be used for making jellies."

56117. Dichotomanthes tristaniaecarpa Kurz. Amygdalaceæ.

"(No. 6702. October, 1922.) A spreading shrub 15 feet high, found west of Hoachiao at an altitude of 7,000 feet. It is very ornamental, with large clusters of berries which are red with a yellowish tinge."

56118 to 56127.

From Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received December 12, 1922. Quoted notes by Mr. Rock.

56118. Castanea sp. Fagaceæ. **Chestnut.**

"(Kancha. October 15, 1922.) A wild chestnut occurring in the mountains one day's trip north of Tengyueh."

56119. Castanea sp. Fagaceæ. **Chestnut.**

"(No. 6683. September, 1922.) Collected at Paitoupu, about 200 feet lower down than the seeds sent previously under the same number [S. P. I. No. 56081], which see for description."

56120. Gaultheria sp. Ericaceæ.

"(No. 6709. October 9, 1922.) A highly ornamental shrub, 10 to 15 feet tall, with long whiplike drooping branches reaching to the ground, found on the summit of the Salwin Divide at an altitude of 8,000 feet. The leaves are leathery and dark green, and the large white flowers are borne in great masses all along the branches. The fruits are dark purplish black."

56121. Prunus sp. Amygdalaceæ. **Plum.**

"(No. 6700. October, 1922.) A tree 20 feet in height, with a spreading crown, which grows wild along brooks in the mountains between Shiaoshuichi and Chutung, at an altitude of 6,000 feet. The small globose, yellow, clingstone plums are little more than an inch in diameter, with firm, rather sour flesh."

56118 to 56127—Continued.

56122 to 56125. PYRUS spp. Malaceæ. **Pear.**

56122. PYRUS sp.

"(No. 6701. October, 1922.) A tree 25 feet high, found in clay soil on the mountains between Hoachiao and the temple of Yung Kwe Ssu. Shayang village, at an altitude of 6,000 to 7,000 feet. The fruits of this tree are larger than those previously found north of Talifu. The natives use this tree as a stock plant."

56123. PYRUS sp.

"(No. 6708. September, 1922.) A very hardy tree 25 to 30 feet high, growing in hard clay soil in the mountains near Yangpi at an altitude of 7,000 feet. The russet-yellow fruits are the size of small marbles."

56124. PYRUS sp.

"(Kiangpienkai. October, 1922.)"

Seeds of a domesticated variety.

56125. PYRUS sp.

"(October, 1922.) A wild pear tree 25 feet in height, closely related to the other wild pears of this region, found beyond Yangpi at an altitude of 8,000 feet. The russet fruits are about half an inch in diameter."

56126. ROSA sp. Rosaceæ. **Rose.**

"(No. 6692. September 27, 1922.) A large rambling or climbing shrub with long stout branches, which grows in the pine forest back of Yangpi, two days' journey west of Talifu, at an altitude of 6,000 feet. The flowers are said to be large and whitish cream colored and the fruits deep red to orange."

56127. ZIZIPHUS sp. Rhamnaceæ.

"(No. 6695. September 27, 1922.) A very hardy tree 20 feet high, with a large, spreading crown, found growing wild in yellow clay soil on the hills back of Yangpi, in company with *Pinus sinensis*, at an altitude of 6,500 feet. The fruits, the size of small olives, are borne in large numbers; they are green with a slight reddish tinge, inedible, with almost no flesh, being mostly skin and stone. The seeds are large, angular, and brown."

56128 to 56141.

From Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received December 19, 1922. Quoted notes by Mr. Rock.

56128 and 56129. CASTANEA spp. Fagaceæ. **Chestnut.**

56128. CASTANEA sp.

"(No. 6714. October 21, 1922.) A large tree 70 to 80 feet tall, found in white sandy micaceous soil on slopes in the mountains 30 li (9 miles) north of Manchi, at an altitude of 6,500 feet. The lanceolate leaves, entire or nearly so, are fawn colored beneath. The burs resemble those of *Castanea armata*, but are smaller; the black, shining nuts are quite small. The trees of this species appeared to be free from all disease."

56129. CASTANEA sp.

"(No. 6715. October 20, 1922.) A large tree, closely resembling *Castanea armata* except in foliage, found on tops of ridges before descending to the Manchi Valley and above Menglien, one and a half days' journey southeast of Tengyueh. The burs and nuts are as large as those of *C. armata*."

56128 to 56141—Continued.

56130. CASTANOPSIS HYSTRIX A. DC.

"(No. 6716. October, 1922.) Collected in the vicinity of Teng yueh."

56131. CHAENOMELES sp. Malaceæ. **Chinese quince.**

"(November 1, 1922.) A wild quince collected on the Puerhfu Plain, near Puerhfu, and sent to me by Miss Clara Petersen, a missionary of Puerhfu."

56132. DIOSPYROS sp. Diospyraceæ. **Persimmon.**

"(No. 2872. Puerhfu. November 1, 1922.) A large tree 60 feet in height, with a huge spreading crown. According to Miss Clara Petersen, who sent me the seeds, the fruits are small and very sweet. This is also a fine shade tree."

56133. DIOSPYROS sp. Diospyraceæ. **Persimmon.**

"(No. 6717. October 23, 1922.) A wild persimmon tree 20 to 25 feet high, which grows in dense forests between Menglieh and Manchi, at an altitude of 6,000 feet. The very numerous oblong yellow fruits are the size of crab apples and sweet."

56134. DIOSPYROS sp. Diospyraceæ. **Persimmon.**

"(No. 6719. October, 1922.) A tree 35 feet high, with few ascending branches, found on the summit ridge on the road from Hsiangta to Manchi, four days' journey southeast of Tengyueh, at an altitude of 7,000 feet. The oblong, velvety, rich-yellow fruits are large for a wild species, being 2 inches in diameter, and the very sweet flesh incloses large seeds."

56135. MALUS sp. Malaceæ. **Apple.**

"(No. 6721. October 30, 1922.) A much-branched tree 35 to 40 feet high, collected in the mountains of the Schweli Basin near Lungling, at an altitude of 6,700 feet. The foliage grows down to the ground, and the lanceolate leaves are dark green above and silvery white beneath. The somewhat ovoid greenish yellow fruits are 2½ inches in diameter, with very fragrant but very sour, firm flesh."

56136. MALUS sp. Malaceæ. **Apple.**

"(November 1, 1922.) A small, sour, hard apple found wild in the mountains a half day's journey from Puerhfu, at an altitude of about 6,000 feet. These seeds were sent to me by Miss Clara Petersen, missionary, of Puerhfu."

56137 to 56141. PYRUS spp. Malaceæ. **Pear.**

56137. PYRUS sp.

"(November 1, 1922.) A wild pear from the mountains near Puerhfu, where it grows at an altitude of about 6,000 feet. The fruits are globose, brown, and spotted, and of very sweet flavor."

56138. PYRUS sp.

"(November 1, 1922.) Collected half a day's journey from Puerhfu, in the mountains. The fruit is large, several inches in diameter, juicy, and contains only one or two seeds."

56139 to 56141. "The following wild pears were collected in the mountains near Puerhfu and sent by Miss Clara Petersen, November 1, 1922."

56139. PYRUS sp.

56140. PYRUS sp.

"A small brown juicy pear."

56141. PYRUS sp.

"A small round pear with brown skin and juicy flesh. The tree is large."

56142 to 56144. Pyrus spp. Malaceæ. Pear.

From Yunnan, China. Seeds collected by J. F. Rock, Agricultural Explorer of the United States Department of Agriculture. Received December 27, 1922. Quotd notes by Mr. Rock.

56142. Pyrus sp.

"(No. 6718. October, 1922.) A wild pear tree 25 to 30 feet in height, with long drooping and ascending central branches, found beyond Menglieh, a day and a half south of Tengyueh. The leaves are oval, broadly heart-shaped, and the globose, yellowish red, spotted fruits, an inch or less in diameter, are closely related to *Pyrus pashia* of southern Yunnan."

56143. Pyrus sp.

"(No. 6720. October, 1922.) A wild pear tree 35 feet high, spreading in habit, with stout trunks and blackish brown bark, found in sandy soil at the summit ridge leading to Mengshi, four days from Tengyueh, at an altitude of 7,000 feet. The leaves, bronze colored to red, are oblong, acuminate at the apex and acute at the base, and the very numerous spherical, yellowish red, spotted fruits are an inch in diameter."

56144. Pyrus sp.

"(No. 6721. November 4, 1922.) A small wild pear tree 15 to 20 feet high, with rambling branches, found with No. 6718 [S. P. I. No. 56142] on the hills beyond Menglieh, at an altitude of 6,000 feet, growing in coarse quartz sand. The leaves are small and dark green, and the fruits, the size of small marbles, are dark yellowish red and spotted."

INDEX OF COMMON AND SCIENTIFIC NAMES

Actinidia chinensis, 55840.
Alcurites sp., 55926.
Amaranthus sp., 55972.
Amygdalus persica, 55831, 55835, 55836, 55885–55888, 55915–55919, 55927–55929.
Anneslia brevipes, 55964.
Apple. See *Malus* spp.
Arachis hypogaea, 55977.
Ash, *Fraxinus micrantha*, 55993.

Bactris utilis. See *Guilielma utilis*.
Bamboo, *Dendrocalamus sikkimensis*, 55815, 56068.
Phyllostachys aurea, 55975.
Bean, common, *Phaseolus vulgaris*, 56074.
Lima, *P. lunatus*, 56073, 56075, 56076.
rice, *P. calcaratus*, 56072.
Yard-Long, *Vigna sesquipedalis*, 56078, 56079.
Bertholletia nobilis, 55914.
Boldo, *Peumus boldus*, 55871.
Brazil nut, *Bertholletia nobilis*, 55914.

Caliandra brevipes. See *Anneslia brevipes*.
Castanea mollissima, 55930.
sativa, 55827.
spp., 55983, 55984, 56080–56083, 56118, 56119, 56128, 56129.
Castanopsis hystrix, 56130.
Castor-bean, *Ricinus communis*, 56027.
Catalpa duclouxii, 55931, 56084.
Catjang, *Vigna cylindrica*, 56077.
Chaenomeles spp., 55985, 56131.
Cherry, *Prunus* spp., 55822, 55823, 55940.
Chestnut. See *Castanea* spp.
Chrysophyllum magalismontana, 56031.
Citron, *Citrus medica*, 56069.
Citrullus vulgaris, 55906.
Citrus decumana. See *C. grandis*.
grandis, 55925.
medica, 56069.
nobilis deliciosa, 55832, 56058.
sp., 56059.
Clover, red, *Trifolium pratense*, 55838.
Colocasia esculenta, 55986.
Corchorus olitorius, 55973.
Corn, *Zea mays*, 55976.
Cornel, Bentham's, *Cornus capitata*, 56085.
Cornus capitata, 56085.
officinalis, 56024.
sp., 55955.
Corylus spp., 55987, 56086.
Cotoneaster hebephylla, 55873.
pannosa, 55896.
spp., 55820, 55821.
Crataegus pinnatifida, 55932, 55988, 56087.
Cucumber, *Cucumis sativus*, 55828, 56030.
Cucumis melo, 55922.
sativus, 55828, 56030.
Cucurbita moschata, 56025.

Dasheen, *Colocasia esculenta*, 55986.
Davidia involucrata, 55911.
involucrata vilmoriniana, 55912, **55913.**
Davidsonia pruriens, 56028.
Dendrocalamus sikkimensis, 55815, 56068.
Dichotomanthes tristaniaecarpa, 56117.
Dioscorea alata, 56071.
pentaphylla, 55924.
sp., 55834.
Diospyros lotus, 56088, 56089.
spp., 56090, 56132–56134.

Escallonia philippiana, 56021.
Eugenia brasiliensis. See *E. dombeyi*.
dombeyi, 55978.

Filbert, *Corylus* sp., 56086.
Fire thorn, *Pyracantha* spp., 55996, **55997.**
Fragaria chiloensis, 56023.
Fraxinus micrantha, 55993.
Fundi, *Syntherisma exilis*, 55974.

Garcinia mangostana, 56070.
oblongifolia, 55894.
Gaultheria sp., 56120.
Grape, *Vitis* sp., 55953.
Grumichama, *Eugenia dombeyi*, 55978.
Guilielma utilis, 55982, 56020.

Hawthorn, *Crataegus pinnatifida*, 55932, 55988, 56087.
Hazelnut, *Corylus* sp., 55987.
Hemerocallis forrestii, 55933.
Honeysuckle, *Lonicera* spp., 55897, 55956.

Incarvillea grandiflora brevipes, 55934.

Jaboticaba, *Myrciaria* spp., 55979, 55981.
Jaboticatuba, *Myrciaria* sp., 55980.
Juglans regia, 55989, 56091.

Leycesteria glaucophylla, 55907.
Lilium tigrinum, 55935.
Lily, tiger, *Lilium tigrinum*, 55935.
Lonicera xerocalyx, 55956.
sp., 55897.
Lycopersicon esculentum, 55841.

Malus spp., 55817, 55889, 55990, 56092–56099, 56135, 56136.
Mangifera indica, 55839.
Mango, Wootten, *Mangifera indica*, 55839.
Mangosteen, *Garcinia mangostana*, 56070.
Meconopsis integrifolia, 55957, 55991.
Meliosma cuneifolia, 55936.
Muskmelon, *Cucumis melo*, 55922.
Myrciaria spp., 55979–55981.

Oak, *Quercus* sp., 56112.
Olea europaea, 55814.
Olive, Arbequina, *Olea europaea*, 55814.
Orange, mandarin, *Citrus nobilis deliciosa*, 55832, 56058.
Oryza sativa, 56026.
Osbeckia crinita, 55908.
Osteomeles schwerinae, 55902.

Paeonia delavayi, 55898, 55937, 55994.
Peony. See *Paeonia delavayi*.
Pangi. See *Pangium edule*.
Pangium edule, 56067.
Papyrius sp., 55938.
Pea, field, *Pisum arvense*, 55874–55877.
garden, *Pisum sativum*, 55878–55880.
Peach, *Amygdalus persica*, 55831, 55835, 55836, 55885–55888, 55915–55919, 55927–55929.
Blanquillo de Mayo, 55915.
De Vino, 55916.
Goodman's Choice, 55831.
Monstruoso amarillo de Viña del Mar, 55917.
O'Higgins, 55918.
Pavía blanco, 55919.
Peanut, *Arachis hypogaea*, 55977.
Pear. See *Pyrus* spp.
Pejibaye, *Guilielma utilis*, 55982, 56020.
Persimmon. See *Diospyros* spp.
Peumus boldus, 55871.
Phaseolus calcaratus, 56072.
lunatus, 56073, 56075, 56076.
vulgaris, 56074.
Phleum pratense, 55837, 56029.
Phyllostachys aurea, 55975.
Pieris formosa, 55909.
Pisum arvense, 55874–55877.
sativum, 55878–55880.
Plocama pendula, 55920.
Plum, *Prunus ursina*, 55872.
Prunus spp., 55818, 55819, 55824, 55901, 55941, 56121.
Polygala arillata, 55939.
Pomegranate, *Punica granatum*, 55923.
Posoqueria latifolia, 55921.
Primrose. See *Primula* spp.
Primula bulleyana, 55995.
chrysopa, 56019.
sinopurpurea, 55899.
vinciflora, 55900.
Prunus persica. See *Amygdalus persica*.
ursina, 55872.
spp., 55818, 55819, 55822–55824, 55901, 55940, 55941, 56121.
Pummelo, *Citrus grandis*, 55925.
Punica granatum, 55923.
Pyracantha spp., 55996, 55997.
Pyrus calleryana dimorphophylla, 55965.
ussuriensis, 55966–55970.
hondoensis, 55971.
spp., 55998–56016, 56101–56111, 56122–56125, 56137–56144.

Quercus sp., 56112.
Quince, Chinese, *Chaenomeles* spp., 55985, 56131.

Raspberry, *Rubus* spp., 55891–55893, 55903.
Ribes glaciale, 55902.
henryi, 56060.
laurifolium, 56061.
longeracemosum, 56062.
maximowiczii, 56063.
sp., 55890.
Rice, *Oryza sativa*, 56026.
Ricinus communis, 56027.
Rosa roxburghii, 56113.
spp., 55905, 55942–55946, 55958–55963, 56017, 56126.
Rose. See *Rosa* spp.
Rubus biflorus, 55825.
fraxinifolius, 55833.
spp., 55826, 55891–55893, 55903, 55904, 56114.
Rye, *Secale cereale*, 55881.

Saccharum officinarum, 55829, 55830, 56064–56066.
Scarlet plume, *Warszewiczia coccinea*, 56022.
Scilla sp., 55947.
Secale cereale, 55881.
Squash, *Cucurbita moschata*, 56025.
Stenocalyx brasiliensis. See *Eugenia dombeyi*.
Strawberry, Chilean, *Fragaria chiloensis*, 56023.
Styrax langkongensis, 56018.
Sugar cane. See *Saccharum officinarum*.
Symplocos glomerata, 55910.
Syntherisma exilis, 55974.

Thea sp., 56115.
Timothy, *Phleum pratense*, 55837, 56029.
Tomato, *Lycopersicon esculentum*, 55841.
Trifolium pratense, 55838.

Triticum aestivum, 55842–55870, 55882–55884, 56032–56057.
vulgare. See *T. aestivum*.

Undetermined, 55954, 56100.
Uvaria calamistrata, 55895.

Vaccinium delavayi, 55948.
sp. 55949.
Viburnum spp., 55950–55952, 56116.
Vigna cylindrica, 56077
sesquipedalis, 56078, 56079.
Vitis sp., 55953.
Voandzeia subterranea, 55816.

Walnut, *Juglans regia*, 55989, 56091.
Warszewiczia coccinea, 56022.
Watermelon, *Citrullus vulgaris*, 55906.
Wheat, common, *Triticum aestivum*:
Aussie, 55842.
Baldknob, 55843.
Boureong, 55869.
Bunge, 55870.
Canberra, 55856.
Carrabin, 55861.
Cuballing, 55862.
Dindiloa, 55863.
Early Bird, 55844.
Forelock, 55845.
Gallipoli, 55857.
Gerralying, 55864.
Gresley, 55858.
Ghurka, 55846.
Wheat, common, *Triticum aestivum*—Continued.
Improved Steinwedel, 55859.
Merredin, 55865.
Minister, 55860.
Nabawa, 55866.
Nangeenan, 55867.
Narrogin, 55868.
Riverina, 55847.
Selection 13 (C1) from Hard Federation, 55848.
19 (C1) from Hard Federation, 55849.
69 (A6) from Hard Federation, 55850.
Stamina, 55851.
Tulun, 56032–56057.
Vavilov's No. 96, 55882.
No. 648, 55883.
No. 1569, 55884.
Wagga No. 49, 55852.
No. 54, 55853.
Wandilla, 55854.
Waratah, 55855.

Yam, *Dioscorea* sp., 55834.
Dioscorea pentaphylla, 55924.
greater, *Dioscorea alata*, 56071.
Yang-tao, *Actinidia chinensis*, 55840.

Zea mays, 55976.
Ziziphus sp., 56127.

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